

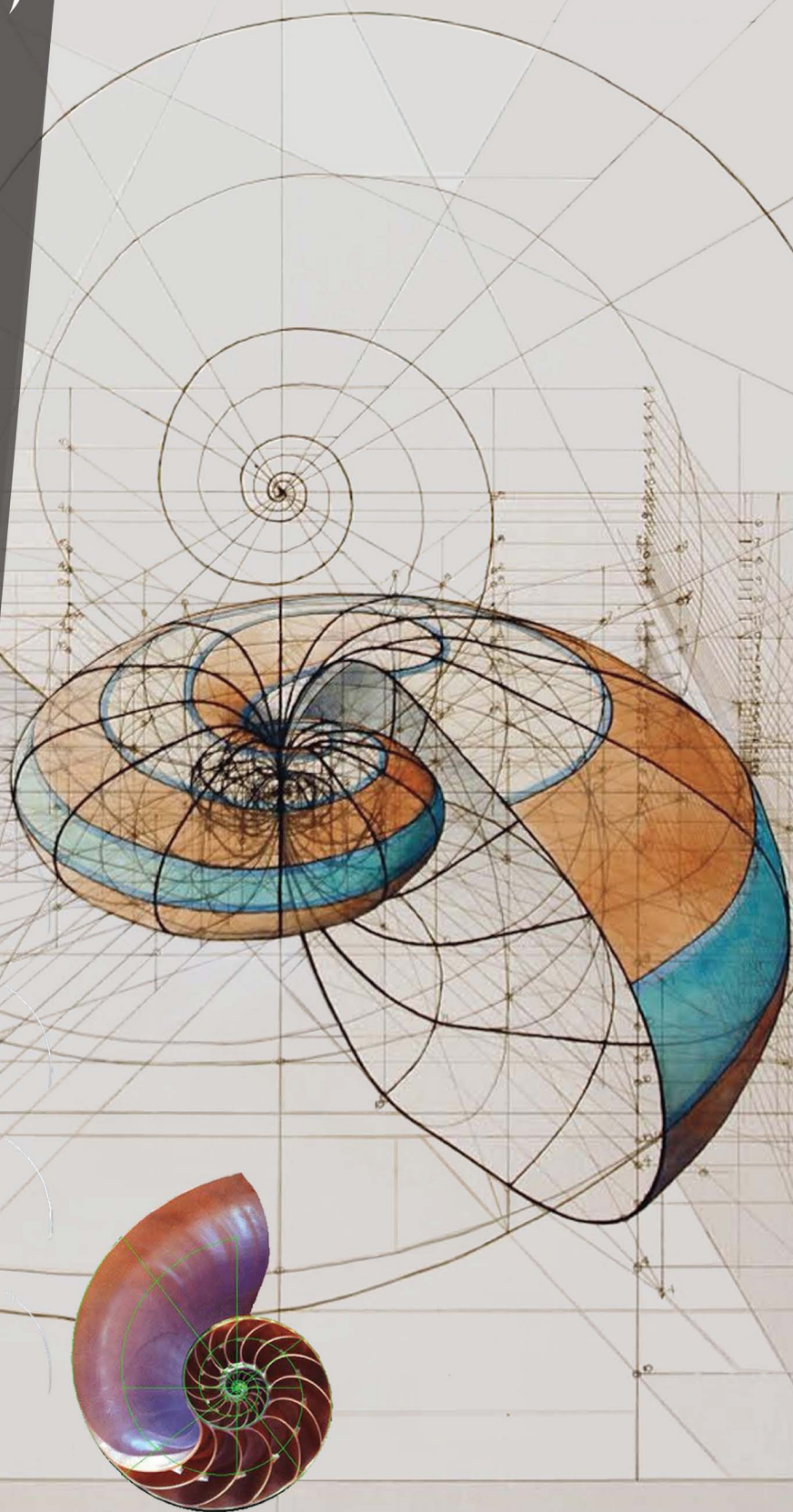
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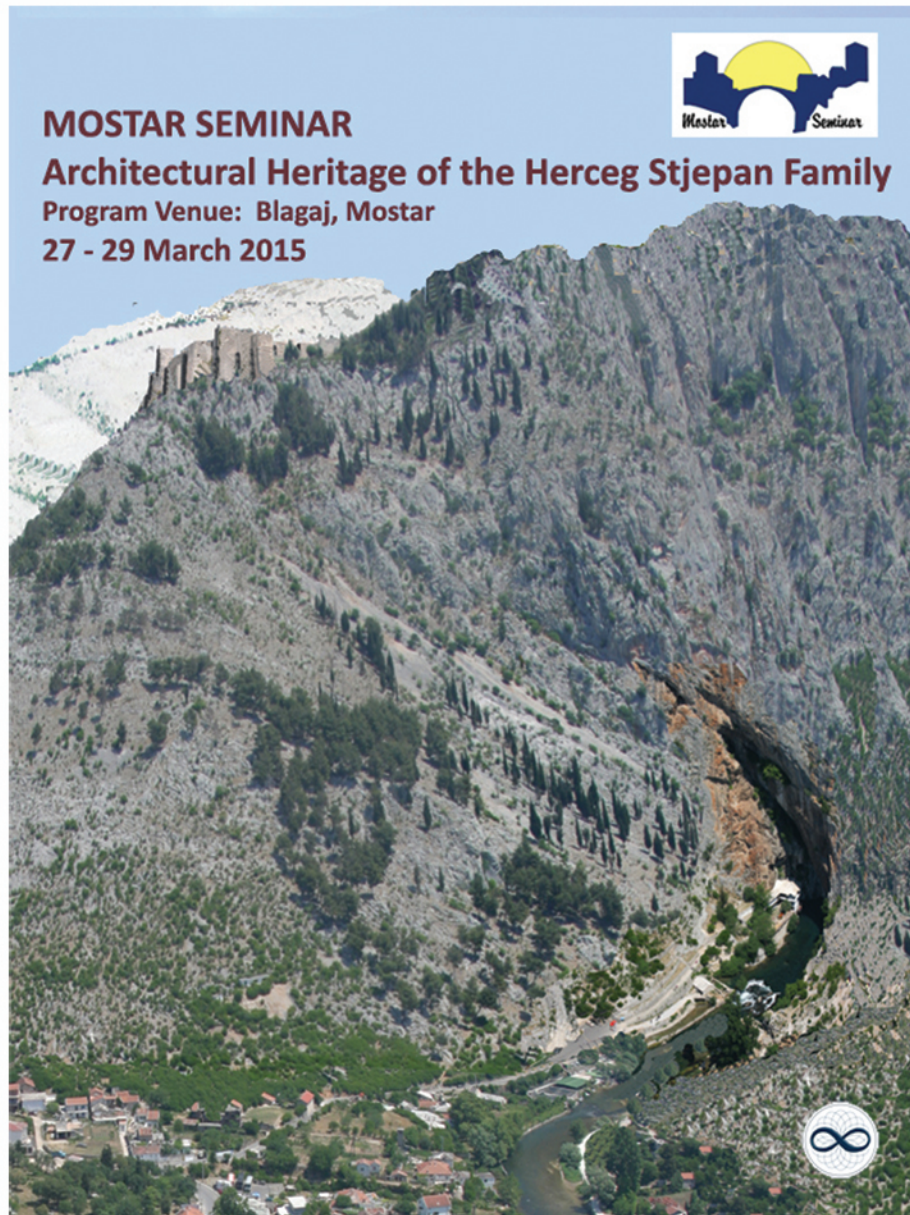
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# Architecture & Science

SCIENTIFIC JOURNAL FOR ARCHITECTURE

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# Monitoring Historic Areas of Istanbul: Potentials for Historic Urban Landscape Approach

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## Abstract

The Historic Areas of Istanbul were inscribed on the World Heritage List in 1985. Since that time, the population of Istanbul has been dramatically increased and the conservation and development challenges changed. Since 2003, Istanbul has been placed under close monitoring process with a risk to be placed on the World Heritage in Danger List.

In this article, the concerns of monitoring missions will be presented and discussed based on the committee decisions and reports which can be found at the website of the World Heritage Center. These concerns include the conservation plan, the timber Ottoman houses, the urban renewal areas, the institutional organization and management and finally the large scale urban and transportation projects.

After analyzing these concerns, the article suggests the Historic Urban Landscape (HUL) as an integrated approach that can be the solution of many of the problems identified by the World Heritage Committee. Moreover, Historic Urban Landscape approach provides a ground for mutual and a balanced existence for a sustainable future.

Keywords: *World Heritage Site, Istanbul, Infrastructure Projects, Halic Metro Bridge, Marmaray Project, Eurasia Tunnel, Historic Silhouette*

## 1. Introduction

The Convention concerning the Protection of the World Cultural and Natural Heritage penned down in 1972 achieved majority of its goals set in its mission. One such significant success is accomplished through The World Heritage List (WHL), which has been a motivation for the countries ratifying the convention. Moreover it has been an area for the display of the international heritage approach and best practice. However, the worldwide challenges ahead of the world heritage have been tuning up the convention to the changing threats as well as expanding conservation concepts. The sites that are inscribed in the early days of the world heritage presently have to adjust their conservation approach and status to a desired level that would fulfill today's expectations. One of such examples is the Historic Areas of Istanbul inscribed on the WHL in 1985.



Istanbul is one of the continuously inhabited historic cities in the world demonstrating a rich heritage starting from the Neolithic period. As the capital of three empires, the city inherited architectural monuments from Roman, Byzantine and Ottoman periods. The outstanding universal value of Istanbul is considered unquestionable due to its place in history.

Istanbul was inscribed on the World Heritage List with the support of many desirous member states along with serious reservations on the conservation status of the property. In those years, Istanbul was city a of 2.500.000 population struggling with industrialization, uncontrolled constructions and political instability. Conservation theory and practice at that time could only address certain concepts that build up the values of the historic city. Urban conservation was relatively a new layer added to the conservation framework, while today the world heritage community is discussing historic urban landscape approach that respects all historic levels, all natural and physical components along with intangible human values. The comments of the advisory body on the nomination file of Istanbul for inscription to the WHL is illuminating on that matter [1].

‘One cannot conceive of the World Heritage List without this city which was built at the crossroads of two continents, which was successively the capital of the Eastern Roman Empire, the Byzantine

Empire and the Ottoman Empire and which has constantly been associated with major events in political history, religious history and art history in Europe and Asia for nearly twenty centuries.

But at the same time, Istanbul is a large metropolis. With its population of nearly 2,500,000 inhabitants, this historic city has undergone population growth in the past twenty years which has profoundly changed its conservation conditions.

The threat of pollution arising from industrialization and rapid and initially uncontrolled urbanization have jeopardized the historical and cultural heritage of the old town, justifying the international appeal for the safeguard of Istanbul which was launched on May 13, 1983 by Mr. Amadau Mahtar M'Baw, Director General of UNESCO.

It is within this context that the proposal for inclusion must be examined.

Its restrictive nature illustrates the recent deterioration of the urban fabric, but also the political will to safeguard a number of privileged sites with the aid of the international community’.

The official records as of 2014 give the current population of Istanbul as 14 million 160 thousand 467 [2]. This figure is nearly 6 times more than what it used to be in 1985. In those years the city was identified as a ‘large metropolis’, today it is a mega-polis. The threats facing the historic city have changed form, mega transportation projects being placed at the top. On the other hand, the dilapidation of the traditional housing stock, problems facing management and conservation of historic areas are still challenges. Even today, Istanbul needs to tackle the problems identified at its inscription, yet it has to deal with bunch of others that have arisen through increasing population and changing concepts of conservation and urban economy.

## **2. Historic Areas of Istanbul**

The inscription of Istanbul to the World Heritage List was a serial nomination. Istanbul as the World Heritage Site, included four focus areas due to the fact that only these sites were protected zones at the time of inscription. These being the archaeological park of Sultanahmet (including Topkapı Palace, Hagia Sofia, Sultanahmet Mosque and remains of Great Palace of Byzantine, etc.), Süleymaniye Mosque and the residential quarter, Zeyrek Conservation Area (including Zeyrek Mosque) and the Land Walls of Istanbul (Figure 1).

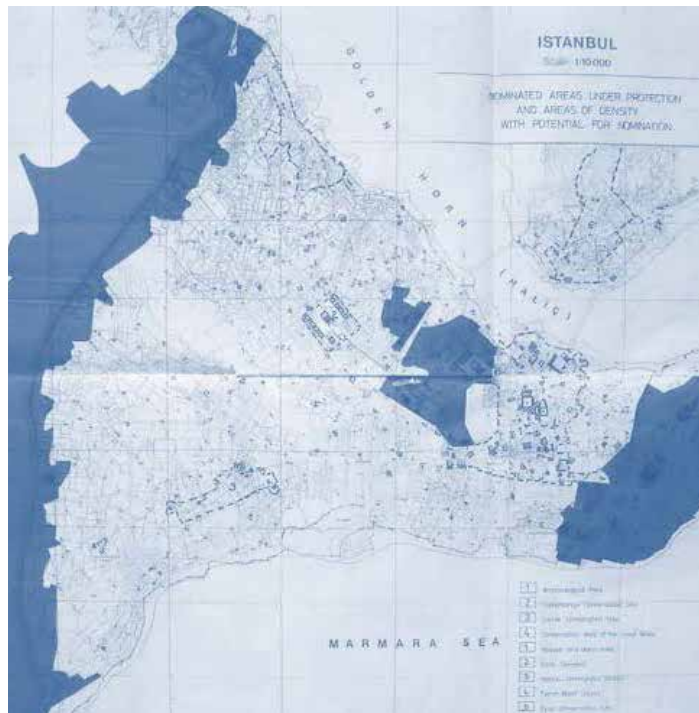


Figure 1. Istanbul as World Heritage Site: Historic Areas. (Source: unknown)

### 3. Conservation Problems of Istanbul

Until 2000s, one of the main obstacles for conservation of historic areas of Istanbul was the economic inadequacy of the property owners who were unable to face the burden of financing maintenance and repair. Government involvement and funding opportunities could not be secured for all of the properties. Therefore, the financial support of the international community has been welcomed more than once. In the past thirty years, UNESCO approved seventeen financial requests summing up to 42.208 USD. However, the economic and political context that Turkey rejoiced in the past years has shifted the status of Turkey from a country in need of financial support from UNESCO to a donor country.

On the other hand, it is observed that the conservation status of Istanbul is worrisome with an accelerating trend. Istanbul is under close monitoring process especially since 2003. In 2008, 2009 and 2012 reactive missions were sent to Istanbul to make on site observations of the state of conservation of the property with a risk to be placed on the World Heritage in Danger List.

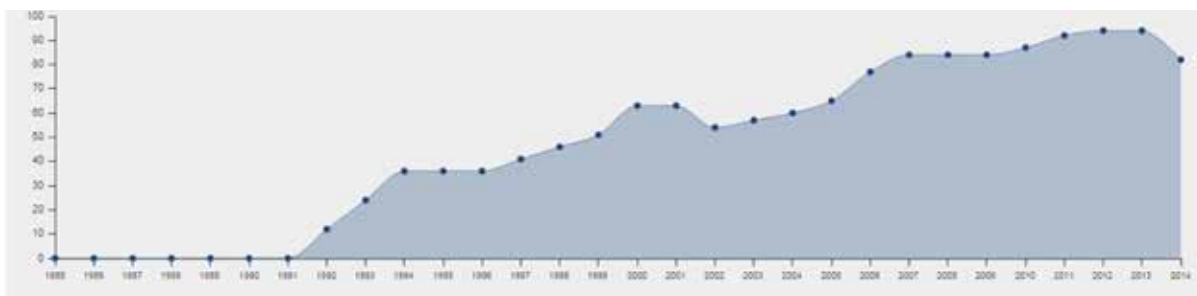


Table 1. Reporting trend of Istanbul based on state of conservation reports. (Source: whc.unesco.org)

The states of conservation and mission reports on Istanbul concentrate on several issues some of which are recurring themes as listed below.

- Conservation Plan
- Timber Ottoman Houses
- Transportation Projects (Marmaray Project, Metro Bridge, Bosphorus Tunnel (Eurasia Tunnel))



- Institutional Organization & Management
- Large Scale Urban Projects (Haydarpaşa, Galataport, 9/16 Residence, Four Seasons Hotel)
- Public Participation
- Urban Renewal Areas
- Theodosian Walls

In this article each concern will be discussed based on committee decisions and state of conservation reports which can be found at the website of the World Heritage Center [3].

### 3.1.Conservation Plan

As expressed by the Director General of UNESCO in 1985, the rapid and uncontrolled urban development Istanbul has faced over the years left the historic quarters in a deteriorated state. In spite of this fact, Istanbul was still included in the list due to its unquestionable role in history and beauties of its monuments. Following the inscription, lack of urban and conservation plans were explicitly expressed in the committee decisions (see Table 2). Although at the national scale the historic urban sites of Istanbul were defined and listed since 1969, succeeding conservation plans could not be prepared and rapid urban growth caused many of those historic urban quarters to degrade.

When looking at the planning history of Istanbul, we see that the need for controlling the urban development in the city through a plan emerged in the 19th century following devastating fires. Foreign experts presented urban plans and designs for the city. At the end of the 19th century several projects were presented to Abdulhamid II of which only a minority got implemented. Those projects that were not realized are illustrative and indicate that the problems of the city were identified at the end of the 19th century. For example J.A. Bouvard prepared urban design projects for squares in Beyazıt, Sultanahmet and Eminönü, Arnodin prepared a project for a bridge that would connect Sarayburnu and Salacak; Eugene Henri Gavand designed an underwater tunnel that would connect two banks of the Bosphorus etc. After 2011, we have seen that many of these initial planning ideas have been imposed on to the city in spite of the fact that the city had already become a mega-pol and a World Heritage Site.

However, before the plan of Henry Prost prepared after the World War II, the city did not benefit from any major planning efforts. While Prost's plan has given the Historic Peninsula (the historic city surrounded by the city walls) a prominence to a certain extend, it identified Sultanahmet area and Topkapı Palace as an archaeological park and limited the building height to 40m which protected the silhouette of Istanbul for a long time, however it did not familiarize an overall conservation strategy. It should also be noted that Prost's decisions, that helped the city to protect its values, were intuitive because conservation theory at that time did not project anything more than protection of the monuments.

In the 1950s, the city lost large areas for urban infrastructure such as opening of large boulevards, and creation of public squares. However it was the 1980s when the historic quarters of the city degenerated most with the uncontrolled migration to the city. Lack of urban and /or conservation plans left deep scars in the historic layers of the city.

In the new code accepted in 1983 nationally, conservation plans became mandatory for the conservation sites (see Code 2863, article 17). The same code was revised in 2004 and the authority for making conservation plans was given to municipalities requiring endorsement of the protection board. This revision underlined the necessity of planning for the conservation area within protected zones. Immediate reactions to this decision are visible in the World Heritage Committee decisions listed in Table 2. Prior to 2004, lack of conservation plans has been one of the major concerns while in 2004 and subsequent years, the municipality of Istanbul has been commended on its achievements in finalizing the approval process of conservation plan for the Historic Peninsula. For the following years, adoption of regulations deriving from the plan remained an issue to be tackled.

Year	Decision
2003	<u>Recalling</u> the repeated concerns expressed by the World Heritage Committee over the delay in the approval of a new urban conservation plan since the abrogation of the previous plan in 1997 <u>Requests</u> the State Party to complete and enact the new urban conservation plan without further delay
2004	<u>Noting</u> with appreciation the completion of the draft 1/5000 scale Urban Conservation and Development Plan <u>Requests</u> urgent completion and enforcement of the Urban Conservation and Development Plan
2005	<u>Noting</u> with appreciation notably in approving the conservation plan for the Historic Peninsula, initiation of the seismic master plan <u>Requests</u> urgent completion of regulations, in order to enable the reinforcement of the Urban Conservation and Development Plan
2006	
2007	
2008	
2009	
2010	<u>Regrets</u> that the State Party has not provided any details of the overall Traffic Plan as requested by the World Heritage Committee, and <u>also expresses its concern</u> about the potential impacts of increased traffic on the historic peninsula;
2011	
2012	
2013	<u>requests</u> the State Party to implement its recommendations and to duly proceed with the annual review of the Management Plan;

Table 2. Committee decisions regarding the conservation plan of Istanbul.

#### 4. Timber Ottoman Houses

Timber as a material is most vulnerable to the aging effects in circumstances of despair and neglect. At the time of inscription to the World Heritage List, timber Ottoman houses were already in a sensitive state which got worse with the immense migration the city received after 1970s. The owners of timber houses who lived in Süleymaniye and Zeyrek residential quarters, moved to other areas with higher comfort conditions, leaving them for the use of lowest income groups or for the use of illegal tenants.

Timber Ottoman houses reflect the living styles of Ottoman extended family life. Originally the use of multistory houses belonged to a single family. However modern family structure and economic conditions has necessitated these houses to be used by independent families on each floor. Reorganization of the plan typology, introduction of modern sanitary facilities that lacked in the original design and lack of maintenance resulted in significance loss of authenticity of the houses. In the following years, land values increased so much that many of the timber houses were lost to the incidental fires, threatening the integrity of the site. Over the years, with the financial support of the international community and with the efforts of national NGOs the timber urban tissue could be saved to a certain extend from altogether loss.

In 2005 Istanbul Municipality set up Conservation, Implementation and Control Bureau (KUDEB) to tackle with simple renovations that are lined up in the bureaucracy of protection boards. Mainly concentrating on facade renovations, the efforts of KUDEB enabled the urban tissue to change its look from a degraded state of conservation. However, same implementations were heavily criticized for not bringing holistic solutions to conservation of the timber structures and considered as a make-up and had negative impacts on the authenticity of the properties.

Existence of illegal tenants and tangled ownership issues have been identified as key problems disabling conservation of timber houses. In order to overcome these difficulties, a new official management instrument was introduced in 2005 as the Renewal Law (Code 5366) with its own institutional framework, allowing easy appropriation and easier procedures for reconstructions. Introduction of this law came at a time when aggressive neo-liberal economic interventions targeted urban land. Although initially this law emerged from necessity; it soon became a tool for gentrification projects. In the meanwhile majority of the houses were reconstructed. When we look at the trends in reconstructions we see that prior to the Renewal Law, the houses were reconstructed in concrete frame and clad with timber, however it is highly positive to see that this has changed with the renewal law and since then, if the building is going to be reconstructed it



is built in its original structural system as timber. However, the insurance companies still refrain themselves from issuing safety to timber houses, which also limits the funding opportunities such as securing a bank credit etc.

The last committee decision (38COM 7B.89) indicated that a crisis point for the timber houses has been reached and an urgent attention is needed (Table 3).

Year	Decision
2003	<u>Noting</u> the reports on probable additional disturbances to the timber building neighborhood of Yenikapı <u>Requests the State Party to make available the technical and financial resources required for emergency measures to prevent the collapse of the timber buildings, particularly in Zeyrek</u>
2004	<u>Expressing appreciation</u> for the launch of the public awareness raising campaign for the protection and enhancement of the timber civil architecture
2005	
2006	<u>Noting with concern</u> the degradation and loss of timber houses, in particular in the Zeyrek and Süleymaniye core areas <u>Submit a revised Süleymaniye Renewal Project</u>
2007	
2008	
2009	
2010	<u>Notes</u> the efforts of 2010 Agency and the National Timber Association and the Municipality's Conservation Implementation and Control Bureau (KUDEB) regarding the preservation of the Ottoman timber houses <u>Urges to also implement The Ottoman style timber houses as key vulnerable attributes of the property, are protected and a programme for their conservation and rehabilitation agreed.</u>
2011	
2012	
2013	<u>Also notes with concern</u> the mission's opinion that a crisis point has been reached for the remaining Ottoman timber buildings, and <u>further requests</u> the State Party to consider a rapid assessment of Ottoman buildings at risk, to reconsider renewal area schemes, to undertake first-aid works in order to slow down the rate of decay

Table 3. Committee decisions regarding the timber houses

## 5. Urban Renewal Areas

The code 5366, put in action in 2005, was initially formulated as a response to overcome the problems to protect timber houses as previously mentioned. This law gives authority to the parliament to assign degraded neighborhoods a “renewal area” status. Prior to 2005, it is seen that the urban conservation and renewals in historic quarters of Istanbul could be made mostly with the international funding, albeit in very limited areas. In order to address larger areas, in spite of its good initial intentions, the renewal law has been used as a facilitator of large scale urban development projects and considered especially problematic for the social aspects. Within the World Heritage site boundaries, Süleymaniye Renewal Area, Ayvansaray Renewal Area and Sulukule Renewal Area are the most controversial ones. Criticisms center on the fact that reconstructions are favored over conservation and with a planning approach treating the properties on a block basis (Table 4, Figure 2).



Figure 2. Interventions at the Sulukule Renewal Area, demolishing and redevelopment (Source: unknown)

Year	Decision
2003	<u>Noting</u> the reports on probable additional disturbances to the timber building neighborhood of Yenikapı <u>Requests</u> the State Party to make available the technical and financial resources required for emergency measures to prevent the collapse of the timber buildings, particularly in Zeyrek
2004	<u>Expressing appreciation</u> for the launch of the public awareness raising campaign for the protection and enhancement of the timber civil architecture
2005	
2006	<u>Noting with concern</u> the degradation and loss of timber houses, in particular in the Zeyrek and Süleymaniye core areas <u>Submit a revised Süleymaniye Renewal Project</u>
2007	
2008	
2009	
2010	<u>Notes</u> the efforts of 2010 Agency and the National Timber Association and the Municipality's Conservation Implementation and Control Bureau (KUDEB) regarding the preservation of the Ottoman timber houses <u>Urges</u> to also implement <u>The Ottoman style timber houses as key vulnerable attributes of the property, are protected and a programme for their conservation and rehabilitation agreed.</u>
2011	
2012	
2013	<u>Also notes with concern</u> the mission's opinion that a crisis point has been reached for the remaining Ottoman timber buildings, and <u>further requests</u> the State Party to consider a rapid assessment of Ottoman buildings at risk, to reconsider renewal area schemes, to undertake first-aid works in order to slow down the rate of decay

Table 4. Committee decisions on the Urban Renewal Areas.

## 6. Institutional Organization and Management

The institutional framework of the World heritage sites in Turkey is defined by a code presented in 2004 where the needed terminology regarding World heritage sites is introduced such as boundaries, buffer zones, site manager, management plan etc. As very well known, since 2000s management plans have become a requirement for newly inscribed sites as well as for sites that are already on the list. The committee decisions acknowledge the efforts of Turkey in establishing a specific unit under the Ministry of Culture and Tourism in 2004 and since then great efforts have been put in place to attain a site manager to each inscribed property and for the sites that are on the Tentative List. Management plans are currently being prepared for most of the sites. Istanbul is a noteworthy example in preparing a management plan considering its challenges. In 2011, the management plan of Istanbul has been finalized only eight years after an office was established to coordinate the project and to monitor it. However completion of the management plan is not considered fully adequate for the World Heritage Committee and over the years it was asked to implement the annual review of the plan as promised.

The metropolitan Istanbul has a significant number of challenges to be addressed through a management plan. Therefore annual review and implementation of the project packages are urgent needs. As a strategic instrument the management plan should facilitate coordination among institutions and be able to create required time and means of negotiations before any project with a negative impact takes on. The management plan that should seek ways of safeguarding the outstanding universal value of Historic Areas of Istanbul is inactive since 2011 (Table 5).

## 7. Large Scale Urban and Transportation Projects

In the last decade Historic Areas of Istanbul has been the center of many interventions, some of which were highly positive and awaited for a long time such as the conservation, management, silhouette master plans etc. Establishment of the Site Management made detailed documentation available for the site. However on the other hand there have been large-scale development projects such as the Golden Horn Metro Bridge, Eurasia Tunnel, Yenikapı Landfill, 9/16 Residence have engaged the world heritage authorities with concern, leading to possible inscription of Historic Areas of Istanbul on the World Heritage in Danger List as expressed in



Year	Decision
2003	
2004	<u>Notes</u> with appreciation establishing a World Heritage Unit within the Ministry of Culture and Tourism and an office in Istanbul for project coordination and monitoring <u>Requests</u> strengthening of the Istanbul Board of Protection of Cultural Property and the special project design and monitoring unit to ensure compliance with the conservation plan <u>Requests</u> develop a more proactive urban management plan to maximize the opportunities presented by major urban infrastructure projects
2005	
2006	<u>Notes</u> the continued efforts made by the national authorities, the Istanbul Metropolitan Municipality and the district municipalities with specific projects including the European Capital of Culture 2010 initiative <u>Re-establish</u> and reorganize the World Heritage Coordination Unit of the Ministry of Culture and Tourism to provide effective support from the central Government for the safeguarding of the integrity of the World Heritage property <u>Request</u> Prepare an integrated and comprehensive World Heritage management plan
2007	<u>Welcomes</u> the appointment of a Site Manager and Steering Committee for the property as a first step, and the establishment of a "UNESCO World Heritage Coordination Unit" in the Ministry of Culture and Tourism and a Focal Point for the World Heritage issues <u>Requests</u> to finalise the integrated and comprehensive World Heritage management plan
2008	<u>Commends</u> for the preparation of the World Heritage management plan; <u>Welcomes</u> the institutional changes that have been initiated to improve the safeguarding of the property <u>Also welcomes</u> the preparation of a draft Statement of Outstanding Universal Value <u>Requests</u> finalize the integrated and comprehensive World Heritage management plan
2009	<u>notes</u> the appointment of a site manager of the property <u>notes</u> that, although some progress has been made in drafting the scope of a management plan, little progress has been made with its drafting it
2010	<u>Notes</u> that the State Party has established a "UNESCO World Heritage Sites and Site Management Directorate" in the Ministry of Culture and Tourism <u>Urges</u> to also implement the A comprehensive management plan is adopted after review by the Advisory Bodies to sustain the Outstanding Universal Value of the property
2011	Acknowledges the efforts of the State Party in the preparation of a draft management plan but considers that the submitted outline of the draft plan falls short of the wide ranging, multi-disciplinary and effective document that is needed, <u>regrets</u> the lack of adequate communication and the lack of adequate responses to its recommendations on the bridge and on the need for conservation plans, an effective management system, development strategies for traffic and tourism, and a buffer zone
2012	<u>Notes</u> that an Advisory Expert Committee has been established, but <u>expresses its regret</u> that the WHC and the Advisory Bodies have not been involved
2013	<u>requests</u> the State Party to implement its recommendations and to duly proceed with the annual review of the Management Plan

Table 5. Committee decisions regarding the institutional organization and management



Figure 3. Silhouette of Istanbul, high-rise buildings and the metro bridge.  
(Sources: left: Kosebay Y. , right: yapi.com.tr)

committee decisions between 2003-2011 (Table 7, Table 6, Figure 3).

One big concern developed around the construction of the metro bridge crossing the Golden Horn. In the committee decisions between 2006-2011 there are several references to this topic asking the property to be placed in Danger List should there be no changes/mitigations in the design of the bridge. As a result in 2010, the bridge construction was halted for a year and mitigations required by the Committee were given consideration by reducing the height of the pylons and other measures. It is perhaps due to this reason since 2011 the risk to be placed on the Danger List is eliminated.

In 2012, the Committee recommended the State Party to appoint an independent expert Advisory Committee for the property, to advise on the development of a strategic framework for infrastructural development and conservation, to guide the management of the property, and to

also consider all possible ways to mitigate the impacts of the Golden Horn Bridge.

In a general overview of the past decade, it can easily be said that the Paragraph 172 of the Operational Guidelines that requires Heritage Impact Assessment to be conducted as an instrument that enables prediction of possible negative impacts before implementation of any large scale intervention has not been utilized timely in any of the projects listed above. Lack of coordination between different decision making bodies, caused irreversible changes in the silhouette and physical shape of the historic peninsula, negatively impacted the perception of Süleymaniye Mosque and other vista points along the Golden Horn. Moreover Historic Peninsula has been transformed into a transportation hub, especially with the introduction of the new eight lane motor way to the heart of the historic peninsula which can not be associated with any conservation approach. It is suggested in 2013 decision that a longer route that emerges the ground beyond the city walls should be preferred in order to mitigate the negative impact of the motorway to the historic buildings.

In relation with the historic walls of the city, the current approach in one area limits the contact of people with sea with the introduction of additional motorway, in another disregards the historic role of the city walls that had human scale urban agriculture land around it.

The archaeological evidence in Istanbul goes 8000 years back from today. The archaeological layers, known for a long time, have not been given consideration in the planning process. Yenikapı Metro excavations for example, although illuminated the history of Istanbul with rich archaeological evidence, can also be interpreted as a casualty of planning decisions because it was not anticipated prior to the metro construction.

Year	Decision
2006	<i>Review all new large-scale development and infrastructure projects, which could threaten the visual integrity of the Historic Peninsula (including skyscraper development such as the Dubai Towers, the proposed high-rise development at Hydarpaşa), the Galata port project, and the new bridge across the Golden Horn as well as the extension project for the Four Seasons Hotel; and carry out impact studies according to international standards</i>
2007	<i>Regrets, however, that the State Party report does not provide information on impact studies for the new large-scale development projects</i> <i>Requests to provide the World Heritage Centre with information on impact studies</i>
2008	<i>Request provide the World Heritage Centre with information on impact studies, including a visual impact assessment,</i>
2009	<i>Also reiterates the redevelopment projects should respect the conservation of existing historic structures</i> <i>Expresses its grave concern at the potential impact of the proposed new metro bridge across the Golden Horn</i> <i>also urges the State Party to abandon this project or consider alternative proposals and submit details of these, together with an independent environmental impact assessments for assessment by ICOMOS before any irreversible decisions are made;</i>
2010	<i>Welcomes the decision to cancel the additional building of the Four Season Hotel</i> <i>Considers that the proposed construction project for a metro bridge with towering cable-stay structures across the Golden Horn might have the potential to irreversibly impact on the Outstanding Universal Value and integrity of the property</i> <i>Notes furthermore that an Independent Environmental Impact Assessment has been commissioned in accordance with methodology of the "ICOMOS.</i> <i>Requests the State Party to provide the results of this assessment which should also include alternative solutions and their impact assessments</i>
2011	<i>expresses its great concern that the bridge, even if amended as proposed, would nevertheless still have an overall negative impact on the OUV</i> <i>Deeply regrets that the bridge was approved in principle in 2005 without any referral to the WHC, not in compliance with Paragraph 172 of the Operational Guidelines, and that its alignment has been fixed by work on metro tunnels on either end, and that further substantial amendments to its alignment and design appear to be almost impossible</i>
2012	<i>Regrets that, according to the information received, no further mitigation measures to the negative visual impact of the proposed Golden Horn Bridge have so far been proposed beyond those already announced by the State Party and examined by the Committee in 2011, and that, as construction work has progressed, no further structural changes are possible</i> <i>urges the State Party to pursue, as a matter of urgency, any further possible work to mitigate the negative visual impact of the proposed Bridge such as through changes to colour and lighting, and to discuss emerging proposals</i>
2013	<i>Recognises the logic and benefits of a Bosphorus road tunnel, but also notes that the currently preferred shorter 5.4 km tunnel option, emerging part way along the southern shore of the Historic Peninsula with a wide 8-13 lane approach road, would have a highly significant, negative impact on the Sea Walls, the Marble Tower, and the overall relationship between the Historic Peninsula and the sea</i> <i>Notes with concern that the Yenikapı project for reclaiming a large area of land (58 hectares) to the south-west of the Historic Peninsula and thus create a recreation area for up to a million people, was started before a Heritage Impact Assessment had been undertaken, and without any advance notification being provided to the World Heritage Committee; and also requests that the State Party finalise the Heritage Impact Assessment, which should include the potential impact of such large gatherings on the environment and infrastructure of the peninsula as a whole</i>

Table 6. Committee decisions regarding the large scale urban and transformation projects



## 7. Evaluation of the Decisions of the World Heritage Committee and Looking Ahead

The author believes that the reflection of committee decisions provide a good resource for scanning through the state of conservation of Historic Areas of Istanbul over the years as symptomatic demonstrations of the challenges. However in order to come to a better state of conservation, the diagnosis of the problem is essential. It is evident that Istanbul has started its journey as a world heritage site in 1985 with a population of 2.5 million, where as today, the physical dimensions of the city have stretched and population of the city has increased tremendously. The diagnosis is that along with many other triggers rooted in history, the city is growing and having difficulties in responding to the needs of the inhabitants while preserving the outstanding universal value of the property that needs to be passed on to new generations.

Year	Recommendations	Decision
2003		Possible Inscription to World Heritage in Danger List 2004
2004		defer consideration of the eventual inscription of the property on the List of World Heritage in Danger until 2006
2005		
2006		possible inscription of the property on the List of World Heritage in Danger in 2008
2007	to invite a joint World Heritage Centre/ ICOMOS reactive monitoring mission in early 2008	
2008	to invite a joint World Heritage Centre/ ICOMOS reactive monitoring mission in early 2009	possible inscription of the property on the List of World Heritage in Danger in 2009
2009		possible inscription of the property on the List of World Heritage in Danger in 2010
2010		possible inscription of the property on the List of World Heritage in Danger in 2011
2011	Recommendsthat the State Party appoint an independent expert Advisory Committee for the property	to submit to the World Heritage Centre, by 1 February 2012, an updated report on the state of conservation of the property
2012	Requests the State Party to invite an urgent joint World Heritage Centre/ ICOMOS reactive monitoring mission	to submit to the World Heritage Centre, by 1 February 2013, an updated report on the state of conservation of the property
2013		to submit to the World Heritage Centre, by 1 February 2015, an updated report on the state of conservation of the property

Table 7. Decisions of the Committee on actions to be taken

Historic Urban Landscape (HUL) approach, presented as a recommendation to the State Parties to the Convention in 2011, envisions historic urban areas to be perceived in a historical span, recognizing the multiple layers together with its subsequent dimensions including the natural constraints of the landscape, historical importance, economic value and social aspects. HUL approach suggests that the needs of the current generations should also be responded avoiding turning the cities into museum towns. Therefore HUL approach anticipates that the living cities may have difficulties when responding the current needs as in the case of Istanbul. However, at the same time it prioritizes the values (outstanding universal value) that make the site a world heritage. Therefore it urges decision makers to take into account an integrated approach, grasping challenges and addressing them to a full extend. In the case of Istanbul many of the problems identified by the World Heritage Committee over the years could have been avoided with an integrated planning approach.

HUL appears to be the solution to the problem with better coordination, active public participation in the decision making process, profound care for the landscape and silhouette, higher sensitivity to social concerns lead to better management of existing historical areas and their expanding. On the other hand, addressing current development needs recognized through HUL approach should not be interpreted as superior over the cultural heritage. Nor it should argue that interventions with negative impacts are unavoidable. On the contrary, Historic Urban Landscape approach provides a ground for mutual and a balanced existence for a sustainable



future. It is therefore recommended that the management plan of Istanbul be revised with a HUL approach, centering people, keeping in mind that the right to cultural heritage is a human right.

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# Abstraction and integration of the complex traditional urban patterns in Bosnia and Herzegovina

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## Abstract

The complexity of the architectural real and abstract dimensions and their integration represents both a problem and a challenge to a meaningful architectural planning and design. Opposing the abstraction to past and tradition, modern urban architecture has been lost the fundamental integrity with its environment and local cultural identity.

Developed from the heterogeneous interactions on different spatiotemporal scales, traditional cultures create their built environment by the more complex approach, establishing holistic and integrated unity with its environment. Traditional urban architecture reveals a specific pattern that could change internally, keeping some basic structure that connects architectural spaces to its natural environment and cultural traditions.

Abstracted principles of the traditional architectural forms and patterns, could uncover its integrative function on different scales, from general public urban structures to more intimate spaces, from collective to individual living. Abstracting the cultural memory of the historical heritage in Bosnia and Herzegovina, on its complex generative principles of developmental space-time levels, applying basic patterns to a new models and material dimensions, architecture could restore its continuity, identity and integrity. Patterns of cultural evolutionary processes, as a base for the transformation and transition to the new existential forms, bring sustainable integrity within individual and collective identity of the space and society.

*Keywords: abstraction, complexity, urban patterns, integration, traditional architecture, Bosnia and Herzegovina*

## 1. Introduction

Modernism tried to open the urban spaces by breaking the old patterns, while it divided the connections, obstructing instead enhancing the dynamics of human life. Modern architecture has separated man not only from natural environment, but from his historical background too, placing him into an abstract realm of idealized geometric space, striving for the liberation of man from his natural and traditional cultural limits, resulting in disintegration of his natural and cultural identity. Degrading natural environment and consuming more energy that could

be provided without further degradation of ecological balance, urban spaces becomes open problem of contemporary civilization. The crisis of contemporary architecture, seeking ways to a more integrated sustainable future, demands reevaluation of the principles on which today's architectural planning and design is conceived. How to reach a dynamic equilibrium of individual and collective living within increased growth, density and heterogeneity, how to balance artificial and natural processes, how to maintain cultural identity and continuity with increased global impacts?

Historical development of human society and architecture, in certain moments comes to a state of crisis, caused by too narrow and rigid boundaries of established forms that become obstacles to growth and progress. On the other hand, the destruction and degradation of old forms leads to fragmentation of the wholeness, degradation of integrity and discontinuities, paralyzing creative development of human society and civilization.

Modern architecture has been causing crises in the second half of 20th century that still need to be resolved. Those crises manifest itself at different levels of reality; on spatial morphological and physical material aspects, constructive and structural technological aspects, socially conditioned utilitarian and functional aspects, to the more general levels of architectural existence, as economic, aesthetic and cultural value aspects. Modern architecture has been based mainly on geometric abstractions, which are characterized by a great degree of separation from the sensory, physical and natural space. Modernism searched for the progress and future in decontextualized abstractions, rejecting the past and tradition as obsolete forms of constraints. The complexity of architectural real and abstract dimensions and their co-ordination and integration, represents both a problem and a challenge to a meaningful architectural planning and design. Opposing geometric abstraction to traditional forms, modern architecture lost the fundamental balance and integrity. The problem of architecture could not be resolved by such opposition, but the balance could be restored only on the integration of the principles of abstraction and cultural tradition, local context and particular individual interests.

## **2. Abstracting the patterns of architectural past**

As Giedion underlined "History is not simply the repository of unchanging facts, but a process, a pattern of living and changing attitudes and interpretations." [1] This pattern is not something unique for every investigation; it depends on the purpose, methods and specific aim of the survey. Reviewing the historic evidence demands a particular kind of abstraction, according to the methods and techniques of investigation.

In architectural design and planning, abstraction is inevitable, developing from design sketches, to technical design plans, mixing the formal geometric laws and informal visual aesthetic requirements. Classical formal geometric abstraction, especially pronounced in modern architecture, cannot be an exclusive and adequate principle of architectural design, because principles of abstraction cannot be directly copied from the different domains. The notion of abstraction is not one-sided, but it has a complex character. Philosophical and psychological, mathematical and geometrical, or computational aspects of abstraction, although having substantial common ground, however, in some respects are different. [2] By abstraction different particulars are joined by their common features, and by abstraction some features are separated from their particular context.

### **2.1. Abstracting the complexity of natural and man-made spatiotemporal patterns**

Abstraction could be used for analysis and examination of the traditional forms and patterns, or for planning the future that could resolve some problems of the current state. Generative principles revealed on abstract level of the historical heritage, could be applied to new functional and material structural problems in architecture, based on structural equivalence of the dynamic



processes based on their function and development.

S. Wolfram defined basic computational equivalence between dynamic processes, and recognized four basic types of dynamic patterns as homogeneous, periodic, complex and chaotic. [3] Complex patterns according to Wolfram show the synthetic quality of every other type, on the border between order and chaos.

Complexity science defines characteristics of complex systems, which has analogies in nature and also in many man-made structures. Natural forms reveal complex structures and patterns, outlining the complex dynamical natural processes. Complexity of natural organic forms has been considered random and chaotic, impossible to present in abstract models, but complex systems science reveals a new kind of order of many irregular forms, by abstraction of some specific features. Complex systems could be different in shape and details of their material substance, but at the more abstract levels they have basic common features. [4] Abstraction of the complex systems uncovers unique principles that govern the dynamics and structural properties of such systems. Complex systems are not just a sum or composition of its individual elements, but a complex relational structure between them, forming a dynamic pattern.

## **2.2. Hierarchy, scales and models of abstracted complexity**

The complexity is a result of nonlinear dynamic, where one level of development becomes generative seed for the next level. Small changes in complex systems provide variations that have quality of diversity, but also carrying the unique general unity in their multitude. Multiplying and repetitive characteristics on different spatial and temporal levels, reveal principles of their correlation. Simon defined hierarchical organization, as one of the basic properties of complex systems [5]. Complex hierarchy is based on different types of connections on different levels and scales, forming the complex network structure.

Complex systems demonstrate complex hierarchy of scales, manifesting different distribution of the size of subunits. Salinger defines a mathematical universal law that governs distribution of sizes in complex hierarchical systems, finding a constant in relations of the size and number of repeated elements of the same size [6]. This law is evident in natural environment at all levels. Sizes and quantity of elements are in reversed proportion, so larger elements are decreased in number, and smaller elements increased.

Connecting properties in the complex systems are distributed not only on the same scale, but also through different scales, forming complex hierarchy. Interconnection of elements and subunits on different scales results in complex pattern of sizes, different density and different levels of connectivity. The emergent properties of the whole system are arising within dynamic of numerous individual connections on various scales. Smaller components of the complex systems contribute to emergent patterns of higher level by their collective performance.

Abstraction of the principles of internal structure of complex forms and processes demands application of the new tools and models. From the computational technology not only new tools are arising, but new scientific fields and models that make a breakthrough to the complexity research as well. New fields of geometry, as fractal geometry, new computational design methods and new algorithmic grammars of shapes and their composition, provide new models for different aspects of abstraction of the specific features of complex systems.

## **3. Patterns of traditional urban architecture in Bosnia and Herzegovina**

Alexander recognized importance of patterns as structured models of relations. He assumed that uncovered underlying traditional architectural patterns could be universal, as invariants of styles and shapes in architecture which summarize "... a property common to all possible ways of solving the stated problem". [7] Abstracted principles of traditional architectural forms and patterns could reveal their integrative function on different scales, from general public urban

networks to more intimate urban spaces.

Bosnia and Herzegovina is placed on the geographical and cultural intersection of multitude influences, resulting in complex history and tradition that is reflected in architectural heritage. Urban architectural heritage in Bosnia and Herzegovina is still preserved in some areas of the modern cities. That heritage has qualities which could be examined and abstracted, to provide basic generative principles that could transform architectural design towards more integrated approach with natural dynamics and complex processes. Investigation of traditional urban architectural patterns in Bosnia and Herzegovina could be grounded both on historic records as on existing architecture emanated from traditional patterns.

Traditional urban structures in Bosnia and Herzegovina were made spontaneously, without formal general planning on a bigger scale. Many cities were grown on intersections of trading paths, as Bosnia was one of the key points for the connection of Ottoman Empire with Europe. In Bosnia, trading centers called “Čaršija” were positioned on the most frequent connecting paths between regions, forming a core of the urban settlements. There are five essential influences that produce city pattern as unwritten building laws in Bosnia and Herzegovina. Those are surrounding hills that define a shape of city, main street as city spine, market place as a core for urban life, vegetation as city lungs and a river as a spring of the city liveliness [8]. Open and flexible spaces, simple designed, spatial connections with nature and use of natural materials, were results of building tradition. Builders themselves were responsible for decisions about material use, geometry shaping and spatial distribution. Bosnian traditional architecture has been designed in human proportions. The scale of the traditional city was appropriate to the human, not only by his anthropology, but also by his needs, destinations and purposes.

### 3.1. Typical traditional urban pattern development - case of Sarajevo

Particular feature of Sarajevo is preserved in its historical part. Namely, in this part of the city, specific patterns of urban structures, in Bosnian called “Mahala” and “Čaršija”, are considered to be conserved in many fundamental features. The historical city center has been built mostly under the influence of the Ottoman culture until the late XIX century, when the Middle European style underpinned further development, leading to the modern urban life of the contemporary city. Sarajevo has been developed conforming to the natural geomorphology. River shore was used for the main footpaths and the city axis, while slopes conveyed radial settlements on the hills. (Figure 1.)

Traditional urban pattern of the city of Sarajevo develops from the basic core formed in the XV century. The city core, Čaršija, was built essentially for commerce and trading, leaving settlements further from the main roads.



Figure 1. Contemporary city of Sarajevo, with more traditional patterns still existing (front down to the upper right), continuing to modern parts of the city, following the river line.  
(Source: B. Čahtarević)

The traditional city of Sarajevo, as typical Bosnian urban settlement under the oriental influence, consisted of the Čaršija in the valley, that contained large density of objects that supply functional activity of the bazaar, as well as the residential units, Mahalas, located on the surrounding slopes. (Figure 2.)



Figure 2. left: Historical reconstruction model of the Sarajevo Čaršija, Museum of City of Sarajevo (Source: B. Čahtarević)

right: Sarajevo mahala, Alifakovac, part of the photo printed between ca. 1890 and 1900, (Source: Library of Congress Prints and Photographs Division, Washington)

A Mahala is made of small residential units, consisting of 40-50 houses, which compose a dense neighborhood area with inner gardens and courts. Mahala patterns of narrow streets and paths, includes a mosque, a religious school, a water fountain, a school and occasionally a bakery or a grocery shop in the center. [9]

Visible border line between the mahalas didn't exist, so they are integral part of the flowing overall urban pattern. Residential zones that are adjusted to terrain, forms an amphitheater around the bazaar in the lower levels. [10] Patterns of the streets in the Sarajevo mahalas, remained almost unchanged for centuries till today, while the objects in them changed according to different dynamics of life and cultural influences of the time. (Figure 3.)



Figure 3. Sarajevo mahala pattern preserved up to today, location Brdo džamija: the mosque with the water fountain, street wall dividing the inner and the outer spaces, green curtains from inner gardens and the narrow streets leading downhill. (Source: B. Čahtarević)

Bosnian-Herzegovinian traditional house in urban areas, shows the characteristics of a mixed influences, mostly oriental, but also some Mediterranean, with specific local materials and tradition. Today there are few historical remains that are restored and preserved as the evidence of the style, the structure and the functionality of the traditional housing. The overall quality of



the traditional living can not be valued in the isolation from the wider context of urban patterns, as Mahalas. The houses in the Sarajevo Mahalas were mainly influenced by the Oriental house style. They were built by the principle that each house had a clear view, light, and inner yard with a green garden. House is enclosed with a court wall facing the street, providing the privacy of the interior space. The upper floor of the house was usually extended overhanging the street, forming a remarkable pattern of the street, "the Doksat". The main gate of the court wall, led to the inner court in front of the house, called "the Avlija", intended for receiving the guests.

Houses managed to keep their intimacy, so that families in the same time lived close to other neighbors, but still have had privacy in their homes. Residential complex was not freely open to the outside viewer, but it was open towards nature. „As far as the residential complex is separated from the outside world, from the streets and uninvited curiosity of passersby, the house and her patio were open, often even vanishing towards the nature, towards the sky, water .... nature becomes an element of the composition“.[11] House adapts to the environment partially by the use of natural local materials for the construction.

### 3.2. Complexity of the traditional urban patterns in Bosnia and Herzegovina

Integration of all spatial and temporal levels of urban life, from different stages and aspects of the individual's life, to different aspects of wider global social context has very complex character. Traditional urban forms in Bosnia and Herzegovina were shaped maintaining continuity and connection to the local environment and cultural traditions. Urban design in the traditional architecture of Bosnia and Herzegovina has been more intuitive, relying on empirical knowledge and inherited patterns that arose from slow bottom-up processes over the multiple generations. On the other side, faster processes based on local changes, and different individual needs and material resources, produced variations that provides diversity and heterogeneity. Complex patterns of traditional urban architecture originate from the integration of the various spatiotemporal scales and mutual interdependence of the connections on smaller and larger scales.

Traditional architectural patterns reveals a complex structure, consisting of the large number of interactive units connected mostly in the nonlinear and organic way. Mahalas as residential zones have been organized almost spontaneously, without any recognizable plan, but their complex overall patterns hide the inner simplicity of the principles by which all houses were built and connected in this interesting urban structure. Buildings were organized in complex network that forms patterns of self-organization, so they don't express rigid formal order and hierarchy. "There are no plans produced by rational deliberation, it's all matter of improvisations and a result of ad hoc ideas and temporally needs. There is no strong axis and absolute symmetry. Not even buildings are built in order." [12] In the traditional architecture simple orders are transferred through many spatial and temporal scales and levels, resulting in the complex emergent forms that can indeed look random and irregular.

Traditional urban house reveals inner spatial pattern that has many different levels, from public to private, including intermediate semi-public spaces. Individual object was connected to its environment on many levels, from actual present everyday life activities, to the contextual local past memories with inherited meanings. Complex traditional urban systems were flexible and adaptable, performing more complex behavior as a manifestation of self-organization.

## 4. Patterns of the past as generative archetypes for planning and designing a sustainable future

Changes in the spatial patterns of contemporary urban spaces are the result of an increase in the dynamics of its life and processes. Dynamics of linear growth, communication and functions of the city life changed rapidly, traditional urban patterns often suddenly broke, losing

the fundamental connections. Traditional culture creates their the built environment by more complex, integrated approach, resulting in complex dynamic balance within the social and natural environment. Traditional urban patterns generated a sense of community, providing many different levels of connections between the local residents as heterogeneous individuals with the common interests. Connections of the elements in the traditional architectural places forms a specific pattern, which can change dynamically, but still manage to keep some basic structure that connects the place to its natural environment and cultural traditions. Functions and forms could evolve but some identity of the place should be preserved. Identity of the complex system distinguishes the system from its environment, allowing the “emergence of systems whose state may change but whose identity is maintained.” [13]. Architectural space in Sarajevo’s mahalas possess a spatiotemporal continuity and vitality, incorporating changes, new elements and functions into the existing patterns. (Figure 4.)



Figure 4. Mixing the old and new in the overall street pattern of Sarajevo mahala, preserved from past up to today. (Source: B. Čahtarević)

#### 4.1. Abstracting and modeling traditional urban patterns

Traditional architectural patterns could become structural archetypes that could reappear on different spatiotemporal scale of the future. C. Alexander in “Pattern language” tried to define universal structure of the invariants in the urban patterns from traditional ones, but it should be emphasized that this pattern must be open, evolving through variations and transformations, in order to design a new pattern based on the previous and that has to be adapted to modified conditions. [14]

In complex models spatial and temporal dynamics could start from higher to lower levels of abstraction, or from lower to higher levels of abstraction. The proper solution lies in their integration, with feedback loops and constant reevaluation. Real contexts and existing material artifacts could be a starting condition, but the solution should be assumed on the more abstract levels, changing the fundamental links and connections, creating a new patterns that allow for new functional dynamics.

Abstract models offer possibilities of representation and simulation of different aspects of the complex processes, on a different spatial and temporal scales. Importance of the abstraction in urban modeling, on a different levels and scales, is not in the representation of the absolute dispositions of the spatial forms, but in the structural connectivity of the system [15]. Higher levels of abstraction of urban processes, could offer generative layout patterns that could be applied to the particular local situations resulting in different solutions.

Contemporary architecture embraces a new computational method of design, in which abstractions are based on a specific approach. Abstraction of the complex process, requires new

models. On the one hand there are new mathematical models as fractal geometry, on the other hand there are computational models such as shape grammars that combines the geometric and computational methods.

Within the computer graphic representation, new models of complex dynamics, provide an insight into the complex hierarchical structures of many natural and biological forms. Fractal geometry describes abstract structures and forms that arose as a result of a continuous process of the transformation at different levels of complexity. Structural patterns manifest a complex regularity - self-similarity, where the structure of a geometric form is reflected in every part, as a result of the process of the recurring transformation. Treating urban structure as a complex dynamic form, Batty and Longley, have developed a new theory using complex models and formal abstract systems such as fractal geometry, which can be used for determination of structural properties of urban patterns, and their development. [16]

Shape grammars as a computational design method are based on the procedural modeling and abstraction of a basic vocabulary elements of the complex spatial forms and their relations. It could be used as a method of survey of the basic organizational principles of the architectural styles and typology. It could also be a foundation of a new design type generation by transformation and variations of the structural parameters.[17] It is not the shape of the units, but their connections that should be modeled, as analytic grammar of the complex levels of their interconnection. Set of rules could have a hierarchical structure. Shape grammars based on the modeling of the correlation and dependencies between the architectural elements and geometrical units, could be used as a method of abstraction of the basic organizational principles of the traditional house typology. Set of rules can be modified at every stage of the design process by a designer, who controls and defines the criteria and parameters for the new design in the particular context. Abstracted shape grammars of the traditional architectural forms, could be generative basis of the new design type, by transformation and variations of the structural parameters.

#### **4.2. Emergence of traditional patterns toward sustainable future**

The principle of abstraction is fundamental not only for the understanding of the complex systems, but also for the creation of new concepts and new forms that could be implemented in particular cases. The path from abstraction to its implementation in the architectural design, implies descending through the various levels of abstraction, until reaching a final materialization and all specific details. This process is not linear, and it is often driven by an intuitive process of the creative thinking.

Traditional urban architecture exhibits two main characteristics of the complex systems: emergence and self-organization. Emergence is a result of synergy and coordination of all elements of a space, forming a complex dynamic pattern. This dynamic is related to self-organization as the internal transformations of the pattern that provide an adaptation to the changing conditions in the external environment. Emergence arises on one spatial level, but it could be distributed on the next, more complex level, forming a hierarchical global pattern. Interactions of the elements in lower levels, lead to global patterns of organization that reflects not only internal connections of the elements of the system, but also the connections of the system to the environment, so that sustainability of the whole system is maintained.

Even today when global economy manages urban development, contemporary architecture in Bosnia and Herzegovina should be directed by harmony of architectural abstraction and shape geometry, with spatial context being conditioned by local native and social ambient as a base of its existence. Human should be still in the focus of the creation process, ruled within interactive and integrated relations of built and natural environment. "Inspiring incentives that the Bosnian and Herzegovinian urban-architectural heritage offers, as a representative of contextual and harmonious relationship between built and the natural environment, implies creative impulses



that result from the analysis of proven values of the site, its basic characteristics, as well as the intimate scale harmonized with the morphological structure of urban coverage.” [18]

## 5. Conclusion

Traditional architectural patterns manifest mostly complex structure, so they are adjusted into the natural environment without interrupting the quality of natural dynamics, establishing the holistic and integrated unity.

Abstraction of the principles of the internal structure of complex forms and processes, demands the application of the new fields of geometry, new tools and new models. Abstracting the patterns of evolutionary processes, as a base for the transformation and transition to the new existential forms, brings continuity and spatiotemporal integrity within the individual and collective identity of space and society.

Generative principles manifested on the abstract level of the historical heritage in Bosnia and Herzegovina, could be applied to the new functional and material structural problems in the architecture, based on structural equivalence of the underlying complex dynamic processes. By integrating cultural memory, abstracting the past and its complex shapes of developmental space-time levels, and applying the basic patterns that provide some fundamental continuity in a new models and material dimensions, architecture could restore its continuity, identity and integrity.

New patterns do not demand repetition of the old forms and functions, but could be used to determine possible design solutions and directions, based on the past developmental levels, examining the current context and anticipating the future projections, including development of different alternatives that provide flexibility and sustainability.

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# Uskudar: Preservation of Heritage and Urban development

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## Abstract

The article is evaluating key urban features of Uskudar, part of the Metropolitan city of Istanbul, and giving a brief urban guideline aiming to protection of the natural and manmade values and to further progress of living conditions for its inhabitants.

Two case studies are discussed in brief: Doğancılar, between Salacak and Ahmediye mahalle, as an example of urban transformation and Kuzguncuk, a Bosphorus village with well-preserved urban texture. The fact that Kuzguncuk houses various public spaces makes it a lively neighborhood not only for its residents, but for the residents of Istanbul as well.

In order to understand current condition of urban development of Uskudar and to discuss the possibility of future development this paper is giving several proposals referring to the existing values of spaces and following fast development of Istanbul globally.

Keywords: *Uskudar, heritage, urban transformation. Doğancılar, Kuzguncuk, urban development guideline*

## 1. Introduction

Urban and architectural development of Uskudar is possible to understand through studying historical documents especially of property deeds of numerous mosques, maps and photographs records, during last hundred and fifty years.

*“Uskudar was called Chrysopolis (Golden City) in antiquity and Skoutarion in Byzantine times. Skoutari was the regiment of shield makers for the imperial army. It must be assumed that the Skoutarian Palace, of which no trace remains in our day, was once on these shores. The invading Persians, Macedonians, Arabs and Crusaders called it Escutaire. The region surrendered to the Ottomans in the 14th century. Following the conquest of Istanbul, its name altered and became Uskudar. One source of this name is said to be EskiDar (Old House)” [1].*

The prominent monuments of Uskudar flourished throughout Ottoman times. In 16th century Uskudar appeared as an important commercial centre, with the number of population increased to 50 000 inhabitants. In 16th century, Uskudar had 91 mosques and mesjids, 51 tekkes, 12 hamams, 11 caravanserais, two public kitchens, seven madrasas, 260 public fountains,

five ports, many kiosks and houses on the waterfronts (yalı), hundreds of shops in the bazaar and many other public buildings. In addition to these, Sultan Suleyman the Magnificent built a palace here [2].



Figure 1. A View on Uskudar from Pera in the beginning of 19th century, (Source: Melling)

By the end of the 16th century, Uskudar was one of the most significant quarters of Istanbul, functioning as the trade hub for Asian countries [2].

Architect Sinan had realized several important projects in Uskudar such as the Mihrimah Sultan Mosque (1547), for the daughter of Suleyman the Magnificent, the Semsî Pasha Mosque (1581), for the Grand vizier, that blended architecture with the natural landscape, and the Atik Valide Mosque (name translation: Old Mosque of the Sultan's Mother) that was one of the most extensive mosque complexes in Istanbul area, built for Nurbanu Sultan, the Venetian-born wife of Sultan Selim II and the mother of Murat III. The mosque completed in 1583 and it was Architect Sinan's last major work [3].

In 17th century new monumental structures were added to urban texture: 12 palaces, 12 mosques and masjids, 5 madrasas, 4 caravanserais and numerous inns and shops [2].

The trend of constructing the significant monumental structures or structures that have strategic importance was continuing in the 18th century. Yeni Valide Complex, completed in 1710 on the iskele (pier) road, commissioned by Emetullah Râbi'a Gülnûş Sultan, mother of Sultan Ahmed III; and the Ayazma Mosque completed in 1760 by architect Mehmed Tahir Ağa for Mihrişah Emine Sultan, the mother of Sultan Mustafa III are significant constructions of that period [2].



Figure 2. Three mosques in Uskudar Shemsî Pasha, Rum Mehmet Pasha and Ayayma, (Source: Pasic A.)

During the 18th and 19th centuries several new quarters were developed in Uskudar. In mid-19th century the north and the south border of Uskudar were edged by huge military complexes: Kuleli Barracks and Selimiye Barracks. Kuleli Barracks were built between Cengelkoy and Vanikoy on the Bosphorus coast (1861-1876) was completed in 1863 by architect Garabet Amina Balyan based on the order of Sultan Abdülaziz on the place where there was an existing the Janissary compound from the 15th century. Selimiye Barracks, were constructed in several phases, between 1825 and 1850, at the site of the old Kavak Palace. It was a gigantic rectangle building 200m x 267m with a large parade ground in the center, and towers -seven stories in height- were added to each of the four corners, giving the barracks the look they have today. In the vicinity of this barrack, the Imperial Medical School (Mekteb-i Tıbbiyye-i Şâhâne) designed by Alexander Vallauray and Raimondo D'Aronco was built in 1902 [4].





Figure 3. Kuleli Barracks (Source: [www.kkk.tsk.tr/Okullar](http://www.kkk.tsk.tr/Okullar)) and Selimiye Barracks (Source: <http://aydinliklighting.com/referanslar/10/selimiye-kislasi>)

A commuter rail line was built on the European side of the city from Sirkeci to Hadimkoy in 1872, which was followed by new part in 1873, from Haydarpaşa Terminal to Izmit on the Anatolian part. The Haydarpaşa Terminal, opened in 1908 on the sea coast in front of Selimiye Barracks was the main transportation hub in Asian part of Istanbul and the busiest rail terminal in Turkey for the whole century. The terminal also had connections to bus and ferry services. (Istanbul Metropolitan Municipality website)

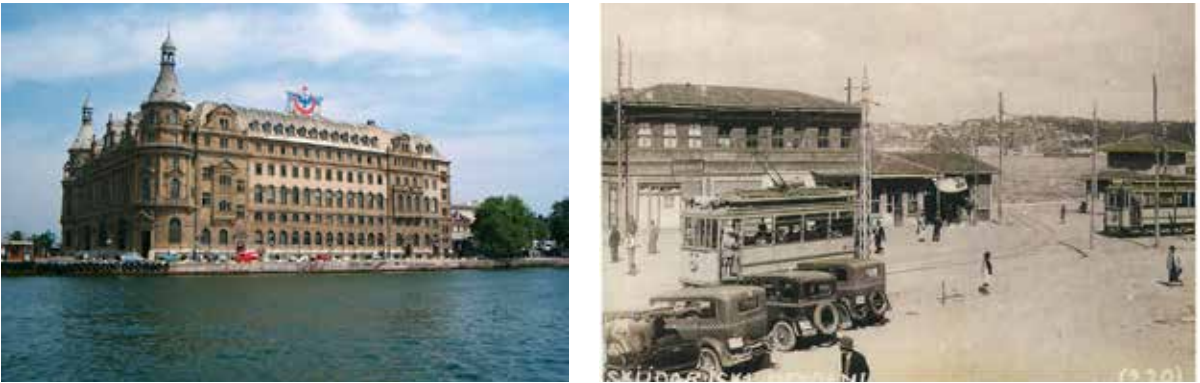


Figure 4. Haydarpaşa Terminal, and Uskudar port around 1935, (Source: [http://en.wikipedia.org/wiki/Haydarpa%C5%9Fa\\_Terminal](http://en.wikipedia.org/wiki/Haydarpa%C5%9Fa_Terminal))



Figure 5. Plan of Selimiye Barracks (Source: Pervitich, 2000)

The ferry is one of the oldest means of transit in Istanbul started in 1837, since it is a city with two parts separated by the Bosphorus. The ferry service began in 1853 with six paddle steamers. After 1903, screw-driven steamboats were put in service. In 1867, vehicle transport started between Kabatas and Uskudar with two ferries, being the first scheduled ferry lines in the world. Bus transportation started in 1926. Between 8 June 1928 and 3 October 1966 the electric tram ran at Asian side, connecting the Uskudar port with Baglarbasi, Kisikli, Karacaahmet and Kadikoy. (Istanbul Metropolitan Municipality website)

During the 1930s construction activities were concentrated in the Uskudar port and serial of depots were built here, whereas the other parts of Uskudar were registered as very big ruin areas

and limited number of new constructions. This information can be traced on the insurance maps realized during several decades by Engineer Jacques Pervititch available in archives, and published in 2000 by Tarih Vakfı [5].

A remaining housing stock had stayed unchanged: wooden two to three stories houses with courtyard and garden.



Figure 6. A view on the central part of Uskudar with port, in the front plan is area around Dogancilar and Uncilar streets. Source: The photograph is from private collection probably taken around 1925.

During the 1970s Uskudar neighborhoods became subjects for destruction of existing housing stocks and green areas, and construction of so-called 'modern multi-storied buildings.

Today, Uskudar is a complex district being an intersection point of multi-cultures, diversities, monumental structures, green landscapes and waterfront relations. Its population is around 600.000 inhabitants settled in 33 neighborhoods on the territory of 3500 hectares, with a large part covered by greenery - only Karacaahmet cemetery has 75 hectares (Üsküdar Municipality website).

Uskudar is blessed with a picturesque image along chains of hills rich woods overlooking the Bosphorus. Such a unique urban mosaic has become the world famous image and identity. Also, it has a unique panorama owing to its location on both Asian and European continents.

This beautiful vista should be protected from high-rise developments along the seafront. Serious attention should be given to designating coastal sites for low-density developments.

## 2. Transformation of Traditional Neighbourhoods of Uskudar

Over first three centuries of Ottoman presence in Istanbul and Uskudar the principles of Islam and the institution of Waqf were essential for constitution and development of the urban fabric and family life. The urban area has been dominated with serial of monumental buildings and most of the open area and green areas (forests and cemeteries) has been attached to these monuments. Housing neighbourhoods (mahalles) were developed around the central part of Uskudar, and through time each of them was enriched by construction of a neighbourhood mosque. Houses in mahalles were built as a family complex, surrounding with a wall, consisting of a house per se (the majority of them were built by timber construction) a courtyard and a garden. Complexes were connected with irregular streets following topography, and thus making organic urban fabric.

In Uskudar, out of typical houses in mahalles, there were larger house complexes with their numerous annexes, a grander version of the neighbourhood houses (Konaks) with large gardens; palaces, yalis (seaside mansions) built along the Bosphorus and kiosks in forest areas for sultans and dignitaries.

At the beginning of the 19th century Uskudar urban area did not have much dense urban fabric comparing to the rest of the city but had a very similar processes and transformation.

As a consequence of new circumstances inside the city, changes of traditional neighbourhood had occurred and consequently these changes had impact on all levels of urban transformation.

Since traditional houses were made of timber, all residential area was sensitive to fires that



were often set on purpose. The fires of 1873 and 1921 destroyed significant section of the Uskudar quarters [2].

Burned neighbourhoods became places to implement new principles of construction not just using new solid materials resistant to the fire, but as well changes of style and typology of buildings. Before mid of the 19th century, burned houses were usually reconstructed in the same manner they were built before, but later on those houses changed were applied, and also, other type of residential buildings were constructed such as row houses and apartment blocks [6]. During the last decades of the 19th century, following intensified industrialization of the city, family profile had changed as well and there was a need for building smaller houses, with use of brick and stone in construction. As a consequence in changing urban forms, square orthogonal and regular plots and norms were introduced, as well as wider roads and squares.

### 2.1. Dogancilar and Salacak areas

Uskudar is consisted of several neighbourhoods. As an example of urban transformation here, a few cases from Dogancilar and Salacak areas will be studied.

Salacak is a neighbourhood located on the coast on a contact between Bosphorus and the Marmara Sea. Till 1980s, before a road along the sea was constructed, there was a pier located here. The pier site was connected with the street (Salacak Iskele Street) with an upper plateau were one of the palace of sultans was existing in the large green area, a location today known as Dogancilar. Initially on this place, a sultan palace was located for centuries - Doğancılar Sarayı. After its demolition, a complex, the People hall, was built on one part of the site in 1928, which later changed tenants- first became office of a local representative of the Istanbul governor, and today is the office of Uskudar Mufti. From the early set up there the park, the Hasan Pasha Mosque, realized by Mimar Sinan in 1548, the Nasuf Mehmed Efendi Mosque and tekke (1690) still exist. [2]



Figure 7. Dogancilar Area and Salacak streets marked on the Source: Pervetich map (No 58-59-60)



Figure 8. A corner of Salacak Iskele Stree and Salacak Iskele Arkasi Sokak. İn 1964 (Çeçener, 2008) and in 2014. (Source: Pasic A. 2014)





Figure 9. Group of building in Salacak Iskele Arkasi Sokak in 1964 (Source: Çeçener, 2008) and in 2014 (Source: Pasic A. 2014)

Other important public buildings in the area are: a hunting palace built in 1799 for Sultan Selim III, in 1928 it was converted to prison and it is still in use; a theatre (the Musahipzade Celal Sahnesi), the fire station, the Burhan Felek High School and two other schools. [2]



Figure 10. Dogancilar area - mapping important structures buildings (Source: Kudumovic L.)

In this area are still many examples of preserved traditional housing structures (e.g. Salacak Street or Dogancilar Street), but also more examples of intensified demolition. Majority of neighbourhoods in the central part of Uskudar share same destiny – a speedy process of urban transformation.

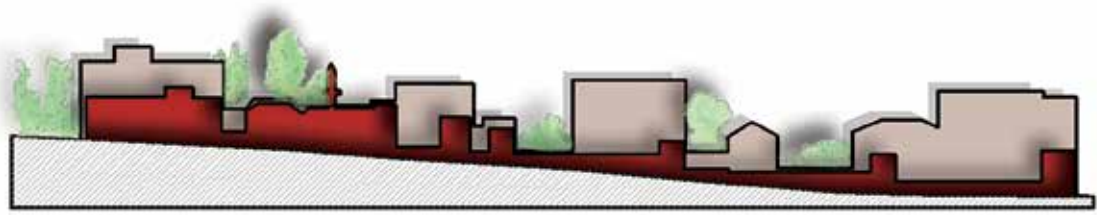


Figure 11. Dogancilar Street façade opposite of the Park from the South side (Source: Kudumovic L.)

Today, it is difficult to define urban code or to read characteristic urban matrix. In situ analysis of these neighbourhoods confirmed “variety” of architectural forms, floor elevations, and usage of materials. Sites are mostly affected by new, bigger structures as infill in green areas, as a response to the needs of socio-economic changes following with a construction boom. Majority of ongoing “transformations” have negative impact on the traditional neighbourhood, through replacement of traditional houses by new structures, inappropriate additions etc.

Relatively, only small numbers of old traditional housing structures and public buildings are preserved, and they can be used as a carrier for future rehabilitation processes based on the maximum respect of defined architectural and spatial values of traditional neighbourhoods. The process of rehabilitation is necessary to prepare instructions for each individual building with regard of contemporary building standards and in the same time to take into consideration the age and seismic security conditions of all structures.



Figure 12. Three houses in same neighborhood: preserved original form (left), successfully restored (middle) and new built with historic reminiscence (right), (Source: Pasic A.)



## 2.2. Kuzguncuk

Having housed various ethno-religious groups of the city, Kuzguncuk has a special place among the Bosphorus villages of Üsküdar. It is significant today being a good example of a well-preserved and lively neighborhood.

Kuzguncuk is developed in a valley opening to the Bosphorus and is located between Paşa Limanı and Beylerbeyi. The district is organized around the İcadiye Avenue that used be a stream bed and the coastal road interrupts Kuzguncuk's relation with the sea. The only access to the Bosphorus is through a small square located in between the walls of the waterside mansions.

Although there are many waterside mansions like Pembe Yalı in the district, the real characteristic of Kuzguncuk comes from the street texture formed by middle-class houses that date to the second half of 19th and beginning of 20th century. These attached buildings were constructed on narrow plots after the fire in 1864. Their height varies from two storeys to four. Some are totally masonry as some has only the ground floor masonry and the upper floor wooden construction [7]. Staircases are located at the heart of these houses which have rectangular plans. The rooms face the street and the gardens at the back [8].

Since the non-Muslims left the neighborhood due to the policy of the state and it was subject to massive immigration as the rest of Istanbul in 1950s, Kuzguncuk started to change. In 1970s another group was introduced to this environment particularly in Kuzguncuk. As the famous architect Cengiz Bektaş had bought a house here in 1978 and restored it and promoted his friends who were mostly artists and architects to do the same, Kuzguncuk developed to be one of the best preserved and popular Bosphorus villages. He believed that restoring the buildings were not enough, but a lively neighborhood should be established to preserve the district. With this approach, in 1980s, Kuzguncuk experienced many activities and many places in the neighborhood were transformed by its residents with the help of children and inhabitants of the neighborhood.

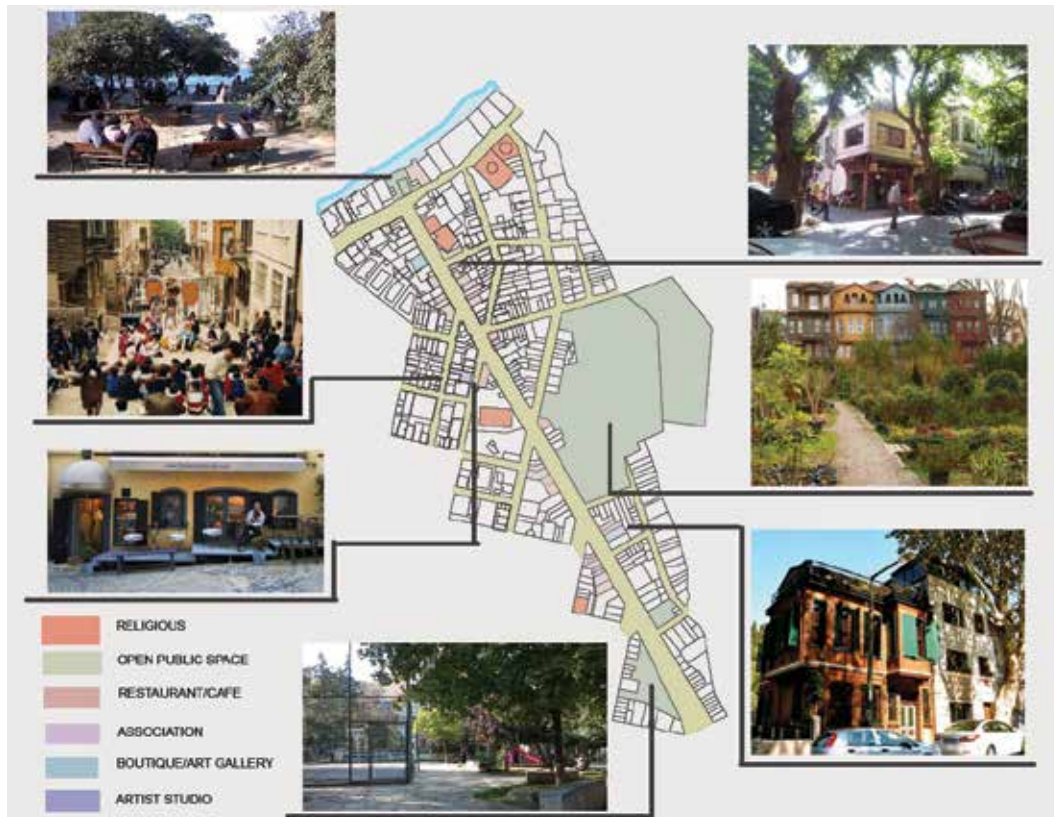


Figure 13. Kuzguncuk, historical area. 1. Square on the sea shore, 2. The stage constructed by Bektaş and his friends on Bereketli Street was used for performances by the inhabitants of Kuzguncuk, 1980s, 3. A café, 4. Kuzguncuk public park, 5. One of the most popular cafes of Kuzguncuk on İcadiye Avenue, 6. İlia's Garden before Üsküdar Municipality's project, 7. A restaurant on İcadiye Avenue. (Source: Çokuğraş, I.)



Today, Kuzguncuk is not only attractive due to its well preserved old houses. The fact that it houses various public spaces makes it a lively neighborhood not only for its residents, but for the residents of Istanbul as well.

The square on the sea shore is one of the most important public spaces of Kuzguncuk. The fact that a famous restaurant and a cafe are located here makes it more popular. The district houses many small parks for public use as well. The most famous green public area of the neighborhood is İlia's Garden. This land was used as a vegetable garden all through its history, and was subject to construction in 90s, which was prevented via the protests of the inhabitants. The garden was not only used to grow vegetables and fruits, but it also housed many open-door activities like festivals, cinemas, workshops and neighborhood gatherings. After many discussions, the Municipality of Üsküdar agreed to keep it as a public garden and developed a project with the locals presented by Kuzguncuklular Association. The on-going project includes a main square for celebrations, cinemas, exhibitions along with sport areas and playgrounds. The main function of the garden is also preserved by vegetable and fruit gardens.

Other important aspect that makes Kuzguncuk a lively neighborhood is the artists' workshops, boutiques, associations, cafes and restaurants. All these different facilities present along İcadiye Avenue gives a dynamic character to the neighborhood. The cafes, restaurants and boutiques selling hand-made items made by the inhabitants are places frequently visited by all Istanbul inhabitants. Apart from these physical features, Kuzguncuk houses many activities that attract both the inhabitants of the district and Istanbul. Festivals and film screenings in İlia's Garden can be given as examples.

Today's Kuzguncuk is not only formed by its history, but by the transformations it went through recently. The conservation works and activities and attempts to create a harmonized neighborhood introducing not only new communal infrastructure (electricity, water and gas), but cultural infrastructure including repairing of human relations, public spaces and land use [8].

### 3. Need for Urban Design Guideline

Great city of Istanbul, and also its central part at the Asian side - Uskudar, need to deal with rapid population growth under the constraint of limited amounts of developable lands, and a tendency to construct to maximum heights. To preserve its urban and architectural values it is necessary to evaluate the city skyline based on the proper urban design guidelines.



Figure 12. Three houses in same neighborhood: preserved original form (left), successfully restored (middle) and new built with historic reminiscence (right), (Source: Pasic A.)

Urban design has a wide range of research content interrelated with various disciplines. Within this content, especially when the formal characteristics of the urban environment are examined, computer and mathematic based models contribute to the discipline as innovative approaches. This process is feasible and very promising using the Geographic Information System (GIS) technology and its 3D modeling functions to construct, assess, and analyze the

city skyline and other planning components by the Istanbul City Planning Department, which has great achievements in this field.

The urban design guidelines recommend that buildings should exist in harmony with surrounding natural features. It also promoted the identity of the city by providing “visual cues” to the people. The 3D GIS visualization affords viewing perspectives from almost every direction to determine the extent to which a built structure has infringed upon the restricted zones or the combined impact a collection of structures has on the surrounding townscape.

Today, numerous cities in the world are much more concerned about their images because a growing of cultural level of their inhabitants, and also, worthy brand for tourist attraction. Many local governments are involving various means to enhance the visual quality of their city skylines by exerting more control over urban and design parameters, as well as by preserve and construct more water facilities and green corridors. But in majority number of cities protection of the skyline is not priority; it became a victim of competition under effect of globalization, and in numerous cases has reached multi-layered chaotic urban structures.

The cities of Istanbul, New York, San Francisco, Sydney, Shanghai, and Toronto are among major metropolitan cities in the world with uniquely identifiable skylines and taking into consideration their developments more attention should be given to this topic.

The term the silhouette (“city skyline” refers to a profile of buildings that forms the cityscape in daytime and the “silhouette” at night). It is symbolized in one glimpse unique characteristics of the history and culture of the city. The “city skyline” (or the “silhouette”) is shaped by human action in the natural setup, topographical conditions, commercial considerations, building design parameters, planning controls and environmental concerns. Skyline should represent all the formal and symbolic codes of the city which is essential to its aesthetic evaluation.



Figure 15. Silhouette of Uskudar between the Bosphorus Bridge and the Maiden Tower: Four components - Sea, Greenery, Sky, and Built (brown color) areas, (Source: Pasic A. 2014)

Both natural (embracing mountains and water bodies) and man-made (including cultural and socioeconomic aspects) contexts should exist coherently and in harmony with each another. Aesthetic value has emerged as an important criterion for evaluating the quality of a city skyline. A higher level of preference and inspiration usually is associated with an advanced silhouette complexity.

Significant visual identity of Istanbul, the Bosphorus skyline, is under attack of so-call prestige projects supported by local governments since 1980s acting under competitive circumstances for gaining a ‘global city vision’ without any consideration for the existing urban pattern. Several of them, at the European side of Bosphorus have been built in a disorganized and unplanned manner, interfering with the most significant visual identity of Istanbul, its properties which constituted the World Heritage of Istanbul.



Figure 16. To protect the silhouette of Cengelkoy (Source: <http://www.valeadamlar.com/tag/cengelkoy-alo-vale>): Not to do as it was done on the opposite, European side of the Bosphorus (Source:unknown)

The proposed guidelines would help to promote public awareness on design considerations besides providing a broad framework for urban design assessments, and should clearly outline criteria and parameters deemed essential in augmenting the visual quality of a city's skyline. These include ridgeline protection, vantage positions, landmarks at strategic locations, and variation in building heights as discussed below. In effect, the contour of maximum building heights can be plotted against the ridgelines to ascertain compliance with this recommendation.

The guidelines also should recommend beneficial points along the Bosphorus that form the bases of preservation of views to ridgelines and peaks. Visual access from these selected positions to the waterfront must be maintained at status quo, reconstructed in previous valuable forms, or enhanced by providing additional elements view. The aim is to allow visual absorbency from the waterfront into the inner areas of Uskudar but also the best view on the Maiden Tower and the Historic Peninsula of Istanbul. This guideline would protect existing microclimate and help develop a better microclimate of the inner areas by facilitating air movement through breezeways.



Figure 17. Uskudar: Skyline between areas of Shemsipasha and Ihsaniye. (Source: Metropolitan)

Urban Design Guidelines, the process of giving physical design direction to urban growth, conservation and change, should be coherent at both regional and local levels, comprising ideas overall urban design framework, city skyline and predominant built characters, embrace a diversity of mass, building heights and configuration, and a variety of architectural styles. The guideline should, among many aspects, carefully regulate heights of buildings to preserve views from the city to the sea and vice versa. This approach has guaranteed that existing and future developments can enjoy the most prestigious positions along the seafront. A good city skyline should be part of the overall design of a city as a whole, and its harmony with surrounding natural features such as ridgelines and peaks, and preserves the centrality of selected buildings as the city's landmarks.

#### 4. General Program Considerations

**Phasing:** Planning proposals must identify the likely phases of development, and describe the critical components that will assure that each phase will result in a 'complete project' at each stage of development. Proposals without clear staging plans, and proposals that must be built all at once, may have a strong negative impact on the existing community and will be difficult to implement.

**Planning human environment:** Site planning proposals must be sensitive to the natural environmental conditions at the site, and ensure that the placement and orientation of buildings and open spaces takes advantage of opportunities to incorporate sustainable design and technologies. New life asks for new development, especially new cultural activities and



an enhanced tourist experience. This means more civic amenities, such as libraries, schools, sport facilities and hospitals, and an improved public realm: the streets, parks, open space and connections between districts that make a city better work.

**Site Access and Security:** All site designs should recognize the need for public transport access to the site, redefinition of key communication spines, and anticipate reasonable security measures. Transportation and communications are the keys to sustaining Uskudar — not just as a major central business district, but also a vibrant, mixed-use community with street life both day and night, weekday and weekend.

**Sense of Place:** Develop a distinctive identity for many sites with respect of functional balance among different neighborhoods, Create interior and exterior spaces of special character, at appropriate scales, that relate to the urban fabric of Uskudar, including its skyline, and create a unified street architecture and landscape.

**Distinctive Skyline:** recognized worldwide is crucial to preserve the spirit of the city.

## 5. Specific proposals

- Reorganization of the transport system to be maximum public: construction of transportation exchange hubs (large-scale garages on the border of the central part of Uskudar and in contact to metro-lines); introducing the Smart Transportation System (AUS) to reduce a car traffic in the central part of Uskudar and very cheap public transport between key public facilities in the Uskudar, and widening of public/housing area above the road along the sea between Salacak Iskele Caddesi (on the South) and Odgul Sokak (on the North), and activation of a historic port -the Salacak iskele.

- Redevelopment program for the Selimiye-Haydarpasha area - the most valuable property in the Metropolitan City of Istanbul with famous historic background and the exceptional potential to be the world highest cultural, tourism and business destination.

- Further development of the Uskudar Center (the Uskudar port area) located among four mosques-historic landmarks (Shemsipasha - Rum Mehmet Pasha-Yeni Valide - Mihrimah Sultan) including: a partial reconstruction of several historic complexes (e.g. Serafabad Kasri, Kaptan Derya Yali); construction of the cabanas along the see to cover all accesses to boats in the port and a pedestrian underground passage between the Marmaray station and ports.

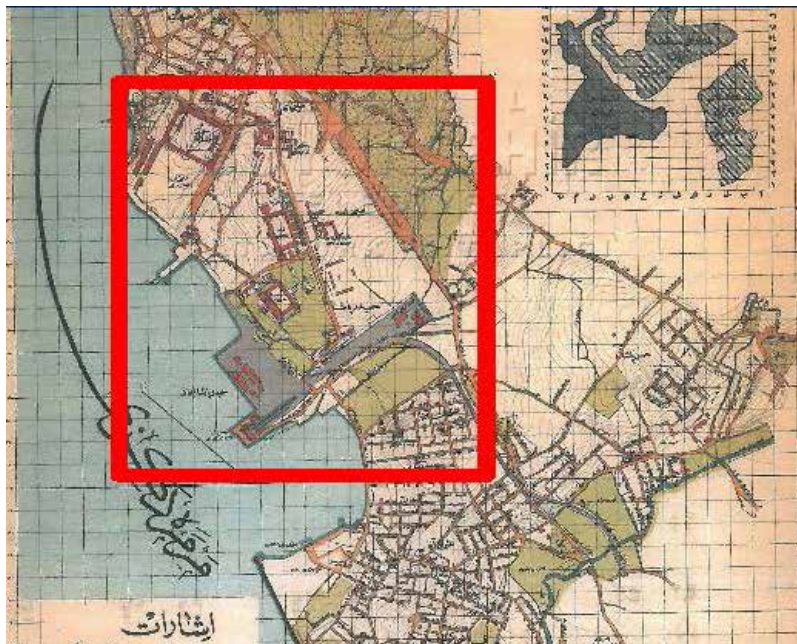


Figure 18. The Selimiye-Haydarpasha area marked on the Uskudar map, 1922.  
(Source: Societe Anonyme Ottomane D'Etudes et D' entreprises Urbanies).



Figure 19. The Serefabad Summer Palace next to Shemsî Pasha Mosque gravure by Eugen Flandin in 1952. (Source: E. Flandin, L'Orient 1984.)



Figure 20. Cabanas, a temporary settled in during the month of Ramadan 2014 in the Uskudar port can be developed in the permanent structure. (Source: Pasic A. )



Figure 21. Map showing the oldest part of Uskudar, which contained all urban elements for the pilot rehabilitation plan. (Source: Pasic A. 2014)

## 6. Conclusion

Having a clear picture of the past development processes characterized with positive and negative impacts, it will be possible to create a platform that will allow to have controlled urban transformation in the future, preserving existing values, enhancing condition of the living spaces of the inhabitants and users and adding new values in the urban fabric.

Today, one of the most crucial problems of Uskudar, as many other districts of Istanbul is the issue of preservation of historic neighborhoods. Future actions related to the neighbourhood of Uskudar should respect existing values and new values should be added to this area as an outcome of contemporary knowledge with full respects of authenticity and integrity of preserved monumental structures and urban matrix-parts of traditional housing neighbourhoods.

Existing landmarks of Uskudar (mosques, several public buildings and housing complexes) should be protected, and new landmarks should be carefully introduced at suitable locations. The provision of new landmarks allows for special consideration of new structures so that their proposed locations must be evaluated against existing setting and their ultimate presence regarded not overly intrusive to maintain the visual coherence of the city.

The contemporary preservation trends suggest that the preserved area should be used permanently and kept alive. As it is seen in a small scale in Kuzguncuk, the essential element of preservation of neighborhoods is the coexisting of private and public spaces. Apart from the relations of neighbors, the opportunities and activities it offers to all Istanbul residents make Kuzguncuk significant in this sense. However, it is very important not to place great demands on the neighborhood and not to get out of the range of social practices that characterize the neighborhood.

Uskudar is part of Metropolitan Istanbul, it is a district with outstanding history and culture, with protected large green zones, in a full contact with Bosphorus and Marmara sea, with numerous mosque complexes and housing areas built in human scale, the city who asks for the proper urban guideline to protect its values given by nature and multiple man-made layers built during three millenniums needs a guideline. This guideline can successfully reduce growing construction pressure of maximum new square meters per parcel, protect a contact with sea, and establish secure pedestrian areas and friendly transportation among public facilities.

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# The Historic Commercial Center of the Old City of Aleppo, lessons from the pre-conflict conservation efforts

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## Abstract

Aleppo, a World Heritage Site since 1986, is the center of the northern region of Syria and has been a crossroad of culture and a renowned station of production and trade for millennia. The historic commercial center of the city covers a total area of about 13.5 hectares and contains different types of commercial buildings in addition to religious and public facilities, which provided for centuries a durable infrastructure for the conduct of trade and manufacturing.

Aleppo has been the site of ongoing conflict since July 2012. Since then, the city has experienced severe losses and damages to its physical structures. Unfortunately, the historic commercial center has been one of the most affected sections in the Old City.

This paper has built on historical and spatial analysis of the historic commercial center and on an assessment of its past and present preservation challenges depending on a thorough research, done between 2010 and 2012, just before the recent conflict has started. Accordingly, it tries to evaluate the conservation strategies adopted by the municipality of the Old City and extract some lessons as a contribution to the reconstruction of this valuable historic fabric when the conditions become favorable.

*Keywords: Old City of Aleppo, historic commercial center, conservation problems, conservation strategies*

## 1. Introduction

The historic commercial center of the Old City of Aleppo, estimated to cover around 13.5 hectares, has witnessed vast urban and social transformations that had major repercussions to its historic fabric. Before recent conflict, the center exhibited the various physical problems facing historic sites. The poor infrastructure, the insufficient services and the high maintenance cost had de-motivated many of its occupants from undertaking major investment in maintenance.

The Old City of Aleppo was recognized as a cultural site of outstanding universal value and inscribed in UNESCO World Heritage List in 1986. Aleppo municipality launched a rehabilitation plan for the Old City in 1992. The plan fostered a comprehensive overall strategy for physical interventions and social and economic development. However, regarding the commercial center, the rehabilitation outcomes were limited and did not reverse the deterioration that it

suffered. The challenge was complex as there was a need to preserve the center's unique historic character, carry out spatial transformations and structural adjustments that bring it to the fore in the competition for investment, and enhance its social and economic vitality and diversity.

The methodological approach of this paper involves a three-step process:

First is defining the cultural values of the historic center through a reading of the urban development and transformation dynamics. For this purpose, the maps prepared for the historic commercial during the 1932 cadastral survey were digitalized and updated in scale 1/1000. Within the updating stage, a rapid appraisal including building heights, historical value, physical condition, compatibility with the surroundings and prevailing traffic systems was developed in order to set up a basis for an overall urban evaluation of the center [1].

Second is assigning the conservation problems through diagnosing the socio-economic and institutional conditions and assessing the limitations of conservation initiatives. The data collection strategy involved surveys and discussions with different stakeholders including public authorities and local people working in the center [1].

Third is outlining alternative strategies for re-thinking the rehabilitation of the commercial center in the post-conflict stage, including the prioritization of actions and the allocation of roles, responsibilities and resources to implement them. The destruction, which the historic commercial center has witnessed since 2012, makes this paper particularly important as the evaluation of the previous conservation efforts and the analysis of the problems that have hindered them, help to develop realistic future strategies that meet the local needs and potentials.

## 2. The Historic and Urban Development of the Historic Commercial Center

Aleppo's location has provided it with the potential of becoming an important commercial and production center since its foundation. The reconstitution studies showed that the commercial center has retained its location since the Hellenistic period in the 3rd century B.C. on both sides of the main avenue extending from the city's western gate, Antioch Gate, to the acropolis (the Citadel now) (Fig.1). On the northern side of this avenue, the location occupied by the Hellenistic agora, the Roman forum and later by the Great Umayyad Mosque, constituted the focal point around which the earliest markets were arranged (Fig. 2) [2].

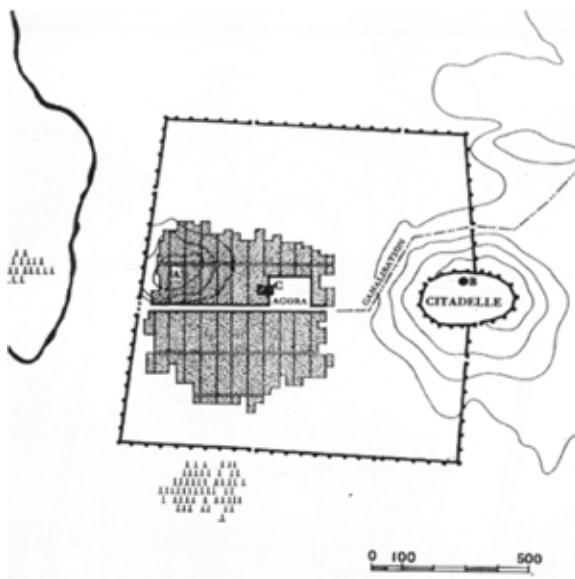


Figure 1. The reconstructed plan of Beoria . (Source: Sauvaget J.)

- A. the pre-historic mound
- B. the acropolis
- C. the main temple

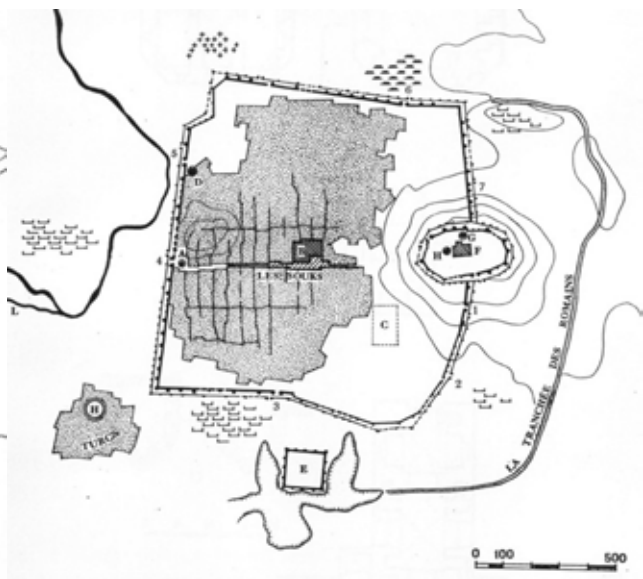


Figure 2. The reconstructed plan of Aleppo in the early Islamic period , (Source: Sauvaget J.)

The description of travelers who visited Aleppo during the first centuries after the Muslim conquest in 636, gave an idea about its commercial facilities. However, they are barely useful to understand the arrangement of the urban fabric of the commercial center. The first detailed image is given by the traveler Ibn Jubayr in 1184 who described the markets built by Nur al-Din Zengi (1146-1174). The markets were vast, sumptuous and provided with timber roofing to shade the shoppers. They enfolded the Great Mosque and each market led to a door of the mosque. Those markets have been burnt several times but consistently rebuilt in the same area [3]. The long-distance trade thrived in Aleppo during the 13th century under the Ayyubids, who rebuilt and expanded the markets. They built the first vaulted markets to the east of the Great Mosque. This area was a densely retail district, specializing in luxury items like goldsmith, silk and other precious fabrics. Several urban khans were mentioned by Ibn Shaddad, especially near the Antioch Gate [4]. However, this commercial zone has been burnt and destroyed during the Mongol invasion in 1260 (Fig. 3).

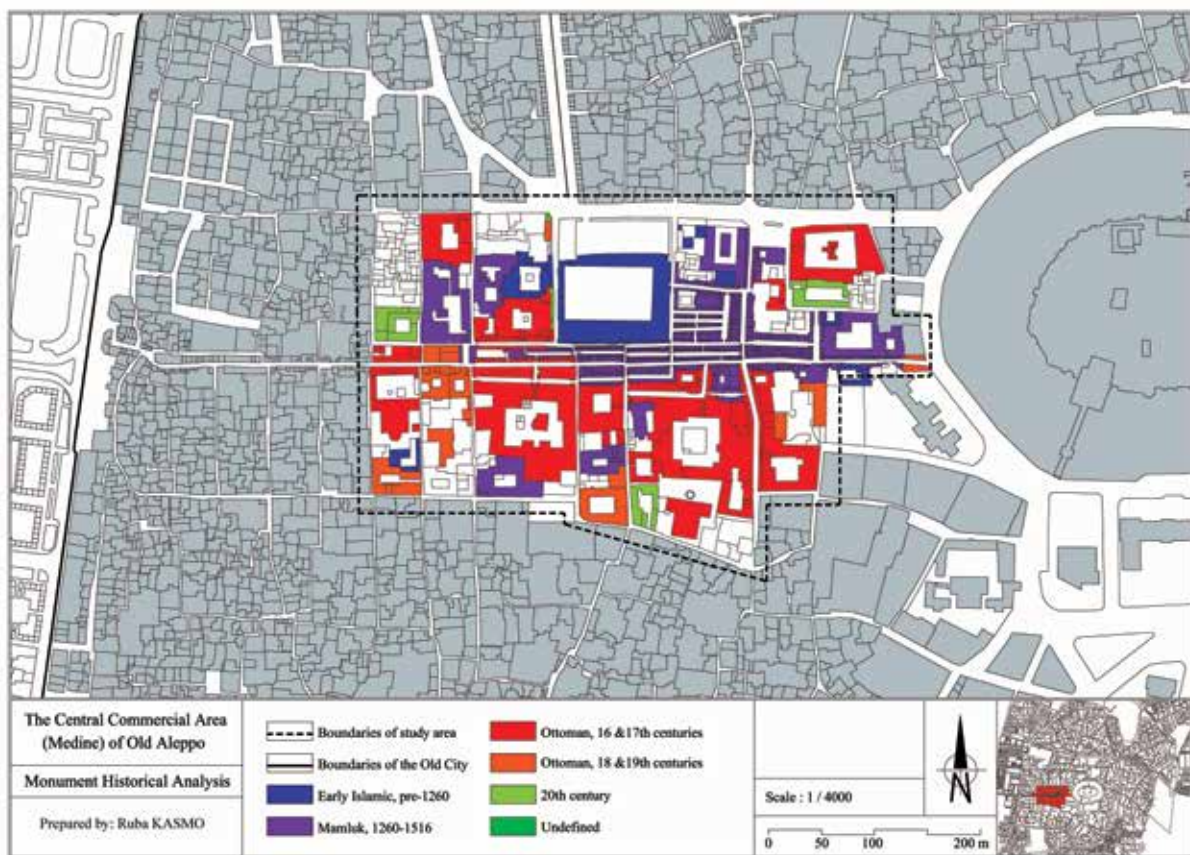


Figure 3. Chronological analysis of the historic commercial center, (Source: Kasm R.)

After their victory on the Mongols in the same year, the Mamluks restored the city and rebuilt its commercial center. In fact, the oldest remaining markets of the commercial zone today cannot be dated earlier than the Mamluk period. These markets are small and constricted, with frequent turns and breaks. Their barrel vaults rarely exceed the breadth of a single shop below (Fig. 4). Among the markets were those of carpets, spices, drugs, the dyers, the coppersmiths and the glaziers [5]. Some small khans were built by the local notable families on the periphery of the central market zone and along thoroughfares leading to the city gates. Ibn al-Ajami mentions 25 khans within the walled city. However, very little remained of those early khans since most of them were taken over by the later Mamluk and Ottoman building campaigns. Within the defined borders of the historic commercial center only three khans remain from that period; the Khan al-Shibani (Fig. 5) [6] and the Khan al-Banadiqa (Venetians), housed the Venetian merchants in the early 15th century and the Khan al-Qawwasin (bow-makers) (Fig. 6) [5], partially survived and incorporated into the Ottoman Khan al-Burghul.





Figure 4. The Mamluk markets  
(Source: Kasmu R.)



Figure 5. Khan al-Shibani  
(Source: Kasmu R.)



Figure 6. Khan al-Banadiqa  
(Source: Kasmu R.)

The geopolitical changes in the region in the 15th century, gave an important boost to Aleppo's position as an international commercial center. The need arose to establish a central commercial zone that can offer such amenities as markets, well-maintained khans, public baths and as well as protection to the merchants travelling with the caravans. Consequently, the central market zone expanded to include large khans, established by the city's governors and officials, in association with retail markets. In such composites, the khan functioned to house merchants, warehouses and large-scale exchange, while the market was given over to retail. The three Mamluk complexes of this campaign included; the al-Sabun (Fig. 7), built by the Emir Azdumur al-Ashafi (1479-94), the al-Qassabiyya (Fig. 8), built by the Emir Abrak in 1510 and the complex of Khayer Bek (Fig. 9), built by the last Mamluk governor of Aleppo Khayer Bek during his tenure in 1514 and completed following the Ottoman conquest [6].



Figure 7. Khan al-Sabun  
(Source: Kasmu R.)



Figure 8. Khan al-Qassabiyya  
and the market of Abrak  
(Source: Kasmu R.)



Figure 9. The khan and market of Khayer  
Bek, (Source: Kasmu R.)

Under Ottoman rule (1516-1916), Aleppo changed from a frontier city on the borders of the Islamic lands into an interior urban center well protected from outside aggression. Moreover, the expansion of the Ottoman Empire towards Iraq, North Africa and Arabia created an enormous market where both individuals and products could circulate freely. Those factors fueled the city's economic, demographic and urban growth in the 16th century to become the third city of the Empire after Istanbul and Cairo. The demand for space for commercial and production activities was strong; and the large Ottoman establishments answered this demand. The large complexes of the period were those of Dukakinzade Mehmed Pasha (1551-1565) (Fig. 10), Sokullu Mehmed Pasha (1574) (Fig. 11), Behram Pasha (1580-1583), Nishanji Mehmed Pasha (1594) (Fig. 12), Arnavut Mehmed Pasha (1635) (Fig. 13) and finally Merzifonlu Kara Mustafa Pasha (1678-1682) (Fig. 14) [6]. The Ottoman complexes, by their extensive size, their architectural quality and the diversity of occupations they accommodated, doubled the commercial core of Aleppo and transformed it into an economic quarter called "al-Madina". This commercial core consisted of over a square kilometer of interlocking streets, filled with shops, workshops, mosques, baths, and khans, all under one contiguous roof [7].



Figure 10. Khan al-Ulabiyya, a part of Dukakinzade Mehmed Pasha's complex  
(Source: Kasmó R.)



Figure 11. The entrance of Khan al-Gumruk, a part of Sokullu Mehmed Pasha's complex  
(Source: Kasmó R.)



Figure 12. The market al-Hibal, a part of Nishanji Mehmed Pasha's complex  
(Source: Kasmó R.)

The markets grew in monumentality. They were conceived as thoroughfares rather than just shopping nodes. Roofing in stonework became standard, with sets of domes and cross vaults. The vaults generally overarched two shops in each side and this was reflected in the great width of the markets (Fig. 15). The Turkish traveler Evliya Celebi visited Aleppo in 1671 and described the markets as follows:

*The suq al-Sultani (imperial market) consists of five thousand seven hundred shops in all with two bedestans like khans. A good number of merchants possessing over 100,000 ghurush are there. Except for the elixir of life, all other sorts of rare and precious merchandise can be found in the city ... Most of the khans and markets are covered with lead roofing so that severe heat does not affect them. Even in July, the market is cool like the cellars of Baghdad ... All the main thoroughfares are paved. Night and day, trash collectors are busy tidying up the streets with their baskets. [8]*



Figure 13. The khan and market al-Harir, a part of Arnavut Mehmed Pasha's complex  
(Source: Kasmó R.)



Figure 14. Khan al-Wazir, a part of Merzi-fonlu Kara Mustafa Pasha's complex  
(Source: Kasmó R.)



Figure 15. The market al-Gumruk, a part of Sokullu Mehmed Pasha's complex  
(Source: Kasmó R.)

Aleppo's international trade declined in the 18th century. However, the city continued to serve as an important regional market and one of the major manufacturing centers of the Ottoman Empire. Consequently, the urban investments shifted from the historic commercial center towards the newly-founded suburban centers which were provided with numerous manufacturing facilities. The center's development slowed down but did not stop totally. Small



complexes were established by local wealthy families such as the complex of Ahmad Pasha Taha Zada (1752) [6]. In 1822, Aleppo was struck by a strong earthquake with an estimated magnitude of about 7.4. Estimates of the number of victims run from 15,000 to 30,000, between 15% and 30% respectively of an estimated population of about 100,000 [6]. The earthquake destroyed parts of the commercial center. However, very little is known about their reconstruction.

The Ottoman reforms in the mid 19th century brought a radical change in the urban life of Aleppo. In 1868, the first municipal body was established. A new city centre began to be developed from 1882, at the northwestern corner of the walled city near al-Faraj Gate, answering to the needs of services and of space for new means of transportation and new regional links. This center quickly expanded and the routes linking it with the historic center were crowded with banks, offices and modern commercial facilities [9]. The old center, however, developed in a coherent urban pattern and maintained its traditional features up to the early 20th century, because of its compound texture and the lack of empty lands for new big projects.

Modern planning in Aleppo started under the French mandate with the establishment of a western type of city administration in 1925 and the creation of a corresponding planning department. In 1932, the city was provided with a cadastral map, which served as the basis for all-future planning [9]. The modern master plans of Aleppo had its repercussion on the historic commercial center. Since the earliest planning schemes, produced in 1900, the suggestion of modernized vehicular network cutting through the old town was proposed. However, most of these proposals were not realized until twenty years later because the vehicular traffic was not important enough to justify for these drastic changes [9].

The real transformation started with the partial implementation of Gutton's Plan 1954. Gutton proposed that the Old City should be crossed by two wide roads running east-west with the aim of establishing "a link from the sea to the desert". The historic commercial center was to be separated from the surrounding urban fabric by an interior ring road in order to give it a direct vehicular access (Fig. 16). In fact, the isolation of the center and clearing of its surrounding fabric corresponded to the idea of "exposing" a monument to spectators [9]. The execution of the first phase of Gutton's proposal led to the full or partial destruction of some of the center's important monuments and forced development pressures right into its heart. The newly opened streets, on the northern, eastern and western sides, cut the traditional thoroughfares leading from the center to the city's gates, thus broke the long established link with the extramural historic centers that had developed outside these gates. Through-traffic created new commercial activities along the sides of the new streets and encouraged the replacement of old buildings with high-rise blocks causing the disruption of the traditional urban pattern.



Figure 16. Gutton's plan 1954. (Source: Bianca S.)



Figure 17. Banshoya's plan 1974. (Source: Bianca S.)



The Banshoya's plan 1974 did not alter the basic concepts of Gutton's plan, but tried to respond to its shortcomings. The inner ring road was eliminated and replaced by a number of dead access ways in order to maintain the coherence of the fabric and to improve vehicular access (Fig. 17). With his proposed roads implemented, all points in the center would be approximately located 200 m from a vehicular access [9]. However, the extensive destruction caused by the execution of the first phase of this plan led the Ministry of Culture to declare the intramural part of Old Aleppo as a national historic area in 1976.

### 3. Conservation Efforts in the 20th Century

Following the declaration of the intramural Old City as a national historic area, Syria's Historic Monuments Law 222 was put into effect to guide and control the interventions and a conservation committee was formed to oversee its application. Later on, the Old City, with both its intramural and extramural parts, was declared a UNESCO world heritage site in 1986. Although these actions succeeded in stopping further demolition, they did not reverse the damage and the decline the Old City suffered, and at the same time, they froze the Old City's development. Thus, Aleppo's municipality in cooperation with the German Government launched (The Rehabilitation Project for the Old City of Aleppo) in 1992, and the Directorate of Old City (DOC) was formed in 1999 to follow up on all the rehabilitation activities.

The Building Control Code for the Old City (Decision no. 39) was issued in 1990 as the first legal instrument to regulate construction and building activity in the Old City. However, it set similar regulations on all buildings, regardless of their architectural or historic significance. Therefore, to improve the quality of interventions the Rehabilitation Project has developed additional (Guidelines for Restoration and Renovation) complemented by technical assistance to ensure their proper application in 1998. Currently, both documents are authoritative in the Old City.

The Old City Development Plan was issued in 1998 to document the Rehabilitation Project's vision, goals, objectives and strategies. Since its issue, it became the key instrument for guiding the Old City development process. The proposed measures for the historic commercial center were:

- The area's boundary to be defined.
- Restoration, renovation, modernization, decoration and maintenance works to be regulated for shops, buildings and streets. Classification of buildings should be developed.
- Retailers and warehouses with heavy supply of traffic should be relocated outside the center. Industrial activities (more than 50 workers and 10 machines) with bad impact have to be relocated outside the center.
- Service traffic to be regulated (time restrictions). Small vehicles and carts for servicing are allowed only [10].

The Land Use Plan, ratified in 2002, was the most important spatial instrument for the Development Plan in guiding preservation and regulating change. It defined allowable uses for buildings on the basis of their location in the urban fabric (Fig. 18). According to the plan, the permitted uses for the historic commercial center were commercial and retail operations, small offices, essentially non-disruptive businesses, traditional service facilities (e.g. public baths) and in exceptional cases, small traditional restaurants and small businesses providing accommodation in khans [10].

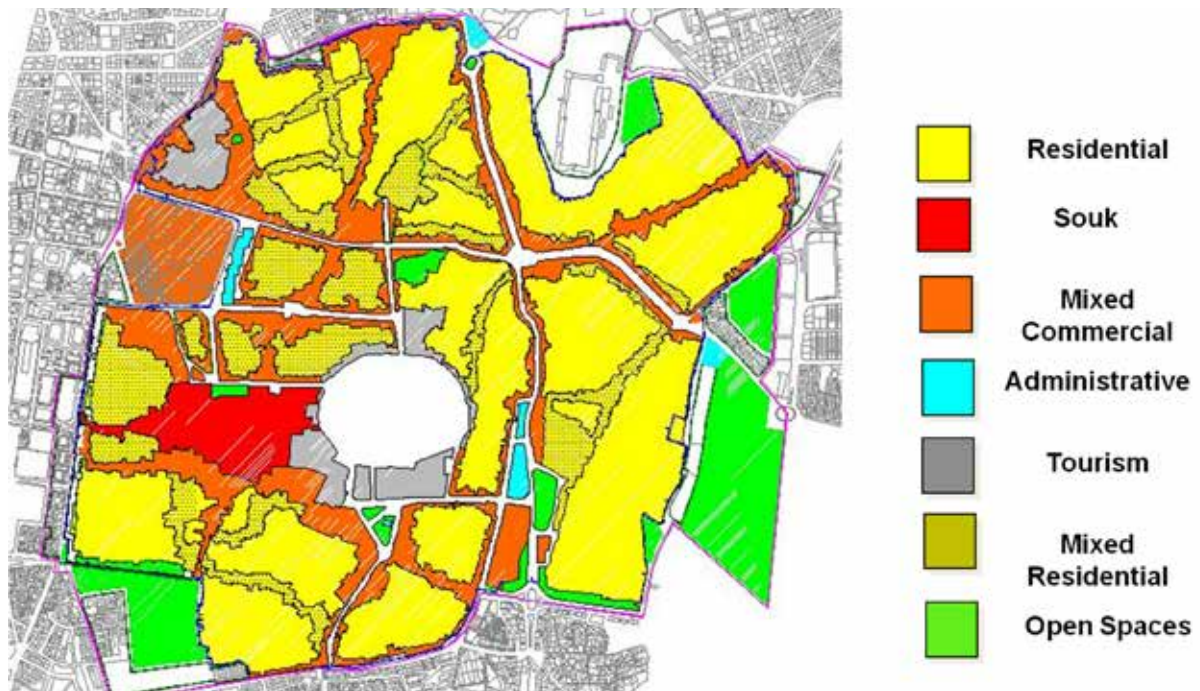


Figure 18. The land-use plan of Old Aleppo (Source: DOC-GTZ, Development Plan.)

#### 4. The Conservation Problems of the Historic Commercial Center

After analyzing the inspected deteriorations in the historic commercial center and their real causes, the main conservation problems were classified under five categories; functional change, urban problems (incompatible structures and traffic), building-scale deteriorations, legal and financial problems (ownership fragmentation and rent control law) and social problems (losing competitive status towards other modern centers and the occupants' lack of awareness).

##### 4.1. Functional Change

The functional changes in the historic commercial center had started by the mid 18th century. The decline of the international trade resulted in many of the accommodating khans to be out of use, thus, were converted into more routine commercial properties used by local merchants and craftsmen as offices, storages and workshops (Fig. 19). Many changes to the original structures were conducted to adapt to the functions. From the early 20th century, many high-income merchants and manufacturing entities started to leave the historic center seeking better work conditions in the modern centers, due to the low accessibility and spatial restrictions of the Old City and the shifting governmental interest towards new districts. The city's economic boom in the 1970s and the substantial rural migration caused a rapid re-occupation of the idle units by new occupants, mainly associated with small-scale businesses. Continuous densification led to fill up all the small plots among the major buildings with encroachments and to subdivide the original structures and convert them to small retail shops and storages. The historic center gradually lost its functional diversity to serve as a center of local-oriented retail commerce and small workshops. The newly opened vehicle roads and the weakness of the neighborhood-scale commercial services in the Old City further increased the demand for retail facilities in the center to serve the Old City's increasing population. Illegal additions and alterations accelerated the deterioration of the urban fabric, such as expanding at the expense of common alleys, constructing encroachments along the buildings' sides and entrances and removing the buildings' external walls in order to use their rooms as shops (Fig. 20). Retail facilities expanded also to the interior spaces of khans and qaysariyyas. The ground floors were used as shops while the upper floors and rear parts were mainly used as storages. Only few khans could retain their role as centers of wholesale trade.



Figure 20. Retail shops opened from khan al-Shibani  
(Source: Kasmó R.)

Figure 19. A workshop inside khan al-Wazir  
(Source: Kasmó R.)

#### 4.2. Urban Problems

The historic center's silhouette line is characterized by low structures (one and two stories), only interrupted by minarets and domes (Fig. 21). The opening of the new vehicular roads in the 1950's and 1970's led to a rise in the land values of the plots along their sides. The first multi-story buildings were constructed along the northern side of the center. Later on, a considerable number of high and incompatible blocks were built in different points around and within the center (Fig. 22). These structures had a negative impact as they disturbed the traditional silhouette and degraded the center's historic and cultural value (Fig. 23). The majority of these blocks were occupied by workshops and storages, which imposed additional load on the already poor infrastructure and increased the demand for vehicular traffic (access and service). Moreover, some of these blocks were attached to the historic buildings generating serious structural problems (Fig. 24).



Figure 21. A general view of the historic commercial center from east  
(Source: Kasmó R.)



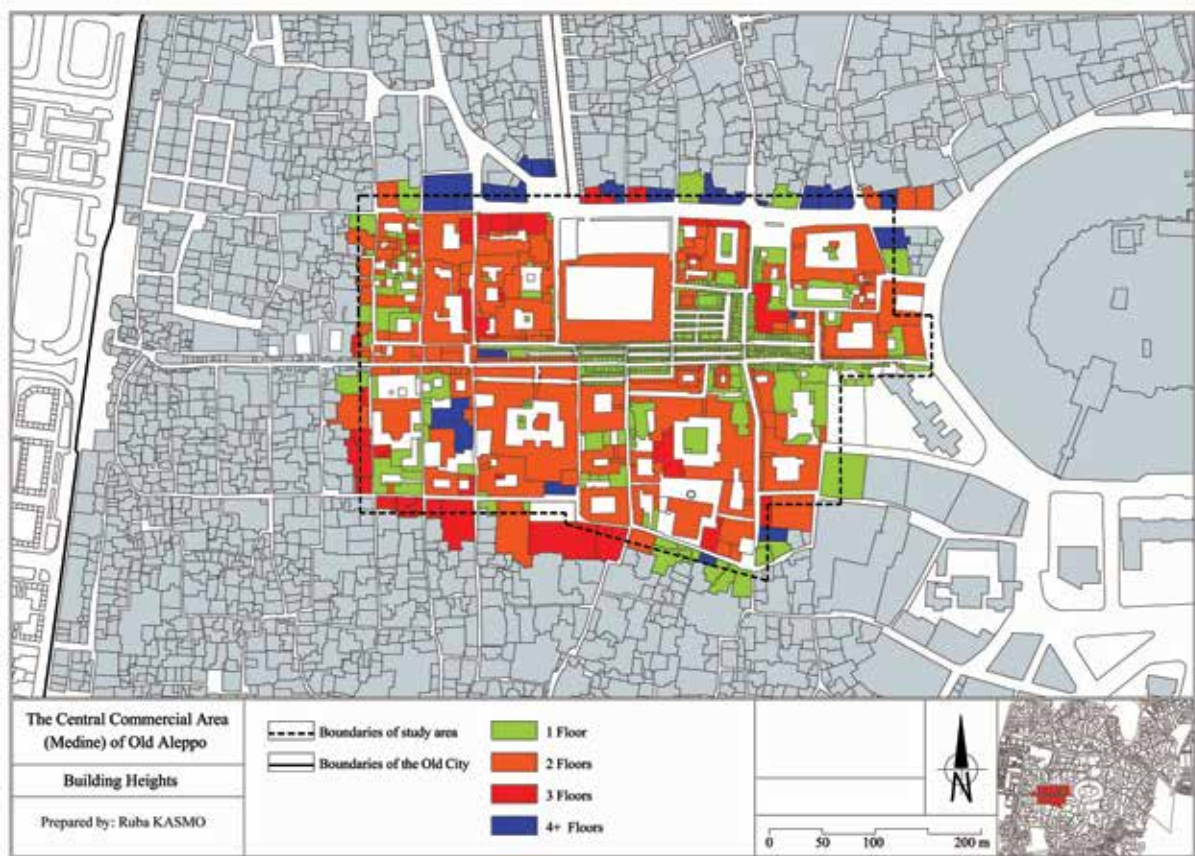


Figure 22. The analysis of building heights in the historic commercial center. (Source: Kasmó R.)

Regarding traffic, there was an urgent need for appropriate taxi stations and suitable public transportation, which do not disturb pedestrian flow and decrease the demand for vehicular traffic. The lack of adequate parking facilities had also been a major problem. The sides of the alleys within the historic center and the courtyards of several buildings were used for parking, which narrowed the common space for pedestrians and degraded the historical and physical status of the area (Fig. 25). The large number of commercial and production facilities generated a lot of service traffic to serve loading, delivering and distributing goods. However, this traffic lacked both spatial and timing regulations, which resulted in several problems. The main means of service, the Suzuki minivans, penetrated the narrow and roofed alleys and entered the buildings' inner courtyards in order to reach their destinations causing many physical problems. The dense circulation, mixed with the pedestrian flow within the narrow alleys produced an almost unbearable situation.



Figure 23. Multi-story structures in the road opened along the center's northern side (Source: Kasmó R.)



Figure 24. Khan al-Sabun, the northern section was destroyed and replaced by a multi-story structure (Source: Kasmó R.)



Figure 25. Khan al-Wazir, using the courtyard for parking (Source: Kasmó R.)

### 4.3. Building-scale Deteriorations

Various physical deteriorations on both the scales of building materials and structural elements were pointed out in the historic commercial center. The main reason of these deteriorations was the lack of maintenance and poor-qualified repairs, which increased the buildings' vulnerability and magnified the effects of natural causes. It was noticed that the prevailing approach of both owners and tenants was ignoring the maintenance and applying deep repairs at long intervals (Fig. 26). The majority of these repairs were unqualified and without technical supervision. Examples of problems varied from finely cracked and flaking plasters into a complete loss of the structural elements. The other reason of the physical deteriorations were the interventions conducted by the occupants as a part of renewal works and structural changing to adapt for new functions (Fig. 27). The majority of these interventions were incompatible due to their negative impact on the structural safety of the buildings on one side, and on their historic and architectural values on the other side [1].



Figure 26. Khan Khayer Bek, lack of maintenance  
(Source: Kasmó R.)



Figure 27. Excessive renovations in the historic markets  
(Source: Kasmó R.)

### 4.4. Legal and Financial Problems

According to the research's results, it was found that four stakeholders shared the properties within the historic commercial center; the private owners, the General Directorate of Endowments, the Establishment of Palestinian Refugees which supervises the properties once owned by the Jewish families, and finally the municipality [1]. Among these, the private owners had the largest share. Generally, the private shares are open to continuous division through inheritance and selling, causing further ownership fragmentation. Moreover, only marginal sections were occupied by owners themselves; the majority of the properties were rented and, under the Syrian Commercial Rent law, renters are quasi-owners with significant interests in their properties.

The administrative systems of the public owners did not support allocating budgets and developing maintenance programs for their properties. Interventions were limited to properties suffering from severe structural problems. Implemented works were generally of poor quality as they dealt with the historic buildings as physical structure without any consideration of their historical and architectural values. Theoretically, the occupants of the rented properties can apply for maintenance works within their units and the public owners may be involved in funding and supervision, however, the high cost of work and the long bureaucratic procedures de-motivated many renters. On the other hand, public owners did not have the legal or administrative instruments to compel tenants to carry out maintenance works.



The commercial rent control had a detrimental impact on the privately owned properties as it inhibited effective decision-making on their use and rehabilitation. As renters cannot be evicted and rent is controlled, owners lost interest in their properties. They did not maintain them, as the cost of maintenance cannot be recovered through higher rent. In some cases, owners preferred the property to remain idle, as they cannot be sure that they can regain control of their buildings later, should they desire to use them [11] (Fig. 28). When renters were willing to maintain, their works were limited to their units and unlikely to share or support major preservation (Fig. 29). Owners and renters in principle could agree on joint maintenance or investment but in practice, such agreements were difficult to implement; as different interests resulted in decision-making paralysis.

Another important issue was that neither owner, nor renter could use their shares in the Old City as collateral to secure loans from banks. This made it more difficult to mobilize resources for preservation and rehabilitation [11].



Figure 28. Dilapidated idle properties in the historic center (Source: Kasmó R.)



Figure 29. Random interventions in the khan al-Farrayin (Source: Kasmó R.)

#### 4.5. Social Problems

Generally, the historic center was no longer a prestigious address for the most of the commercial establishments. The deterioration of buildings and the insufficient municipal services were the major factors in the continuous departure to modern centers. In the recent years before the conflict, the center retained hundreds of workshops and shops, which appealed mostly to a lower income, traditional, and often rural clientele. Although it remained the place of some types of services that have a long history and tradition, including traditional crafts and textile traders, however, the majority of these occupants preferred to move out, if they have the chance. On the other side, the general lack of the sense of responsibility and the awareness of the center's architectural and historic values among the occupants led to many detrimental practices.

During the survey, many occupants expressed their need to see a strong government commitment to improve the center that is not limited to one or two years, but extends to the long-term. Consequently, they would be encouraged to start investments. They also expressed their need to be involved in the decision-making process, especially with the issues relating to their work environment and urban management [1]. In fact, municipal interventions have been done regarding the street paving, the façade cleaning, and the unification of shop-fronts and awnings in order to improve the image of the historic center (Fig. 30, 31). However, the practicality of these initiatives and their response to people's needs were questionable and generated controversial reactions among the occupants. While some appreciated the improvement to the public space, some criticized it and argued that buildings were restored while water and sewage were still leaking and ruining the basements of the restored buildings.





Figure 30. Upgrading the surroundings of the Great Mosque  
(Source: Kasmu R.)



Figure 31. Cleaning facades and unifying shop-fronts, a. before, b. after  
(Source: Kasmu R.)



## 5. Conclusion

As a result, it is undeniable that the conservation efforts of the Directorate of the Old City had achieved significant results. Still, there were major obstacles that limited desired impacts. While many of these obstacles were external to the Directorate and out of its control, some were resulting from gaps between the conservation strategies and the socio-economic realities of the historic center, the Old City and the Metropolitan city as a whole. Some of these obstacles can be defined as; first; the absence of the main planning means, a detailed master plan, a comprehensive building code and urban management regulations, second; the unavailability of adequate financial resources, and third; the centralized decision-making and the lack of representation of targeted groups.

During post-conflict period, rehabilitating built heritage helps the population to remember their creativity and provides them with the needed power to aspire. In the case of the historic commercial center of the old city of Aleppo, the rehabilitation is not only essential due to its cultural significance, but also due to the vital economic and social role, it occupies in the lives of Aleppo's people. However, this process is at a crossroad. Either, it can continue with the strategy that has been applied before the conflict; focusing on physical planning and interventions funded by one-time contributions. Alternatively, it can follow an enabling framework focusing, besides the physical planning, on changes in the legal, financial and organizational systems that can provide a base for a sustainable process. In fact, the complexity of the task, the advanced level of physical destruction and the socio-economic realities all call for the second choice and for unconventional solutions. Moreover, we have examples from the history of the city for some unconventional legal and financial solutions that have been invented at times of crisis. In 1822, the impact of the strong earthquake that hit the city was massive and resulted in the destruction of about 60% of the urban fabric. The revenues of the endowed properties, which constituted the vast majority of the deteriorated buildings, were scarce and unable to cover the high costs of reconstruction. Therefore, the scholars and the lawmakers of the city devised new systems for the administration of the endowed buildings such as the long-term rents (*nizam al-Ijaraten*) and the replacement contracts (*al-Istibdal*) in order to attract the private capitals [12]

The objectives for the rehabilitation of the historic commercial center must be defined as twofold, to revive the economic development and to rebuild the historic fabric. This implies upgrading infrastructure, enhancing access, providing services, as well as repairing and reconstructing the historic buildings. In order to guarantee the process's sustainability, it must be built depending on an incentive-based approach and takes into account the following points:

- Providing multi-level incentives to encourage private investment;
- Articulating more workable regulations for the physical interventions;
- Promoting participatory mechanisms to mobilize people and to enhance their sense of responsibility towards the historic built environment.

Meeting the challenges, which previously hindered the conservation efforts in the historic commercial center, will be a matter of a high priority during the post-conflict rehabilitation. There will be a large number of complicated cases that require primarily critical thinking and more flexible approach in dealing with heritage. Discussions and actions to solve many of these obstacles, especially those related to legal and financial issues, can start now. Thus when the favorable time comes, the actual reconstruction can be started on a solid foundation. Finally, I re-emphasize that the task is complicated and needs the collective efforts of the local and international experts.

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# Sustainable heritage management of the upper Town of Herceg Novi

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## Abstract

Sustainable managing for historic urban landscape must be understood with complete methodology approach in the obligate phases:

1. The past: /interdisciplinary research and conclusions from urban geneology
2. The present: /interdisciplinary research and analyses of actual existing urban and architectonic structures/
3. The future: /interdisciplinary approach for sustainable, time flexible functional model under the obligate restauration and conservation principals/

Keywords: *sustainability, urban planning, architectural heritage, protection, Herceg Novi, Španjola...*

## 1. Introduction

Wider urban area of Herceg Novi, Upper Fortress "Spanjola" has evidential urban and architectural heritage, and also bears significant cultural, aesthetic and artistic value. These were the motives for research study of urban genesis of this structure.

The Upper Fortress-Spanjola is all build in human scale as careful mini urban structure. This Urban structure permanently was off side from actually reconstructions and revitalization of architectonic monument heritage found of the community of Herceg Novi. There were no any activities for Upper Fortress to be incorporated and interpolated in existing urban surrounding of the Herceg Novi. Also, the catastrophic earthquake from 1979 did not accelerate interests for re-urbanization this structure.

No prior research activities or any planning work, in this urban area have been performed. Since the future holds very sensitive and delicate task, restoration and revitalization of Upper Fortress, the motive for this study grew stronger. Hence, this work claims to process the urban genesis and principles of re-urbanization of Upper Fortress, Herceg Novi.

This agglomeration, which deserves higher attention for research and protection, did not have such treatment neither after catastrophic earthquake (IX degrees on Mercalli scale). On the contrary, this event accelerated the dying process of abandoned urban settlement in Upper Fortress Herceg Novi, which started at the end of WWII. After its function as military fortress has



ceased, it started to be formed as hollow and empty mini urban agglomeration. It was bypassed in all urban plans, but the planning drawings and plans a great number of new facts on the level of urban genesis for urban settlements were discovered. The research was realized starting from known facts as they stay today, to the unknown facts in the past.[1]

Definitely it is possible to confirm, that the first realistic information about urban settlements on Adriatic coast come from cadastral plans from the end of 19th century. In case of Herceg Novi that is Austro-Hungarian cadastral plan from 1890. If we take note that all of these urban settlements stagnated in development during the first years of 20th century it means that mentioned cadastral plans or parts of them present earlier period, too.

Rectification of old urban settlements[3] drawings and plans was done by redrawing on the base of land survey maps from present time, in the scale 1:1000, using all available tools. All these rectified designs can be used for further research.

The following methodology has been used: The old drawing or plan, presented by photonegative source was presented on the scale 1:1000 using geodetic methodology called revision and covered as layer over current land survey map on the scale 1:1000. After that over these two layers it is possible make a rectified drawing of the old plan, relying on real dimensions from current layer, and known facts from research on archival records. In this way it is possible to get rectified old plan.

If perspective was shown together with the old plan, its rectification has been done in the same way. As the final result both of these rectifications, new interpretation is shown, which resulted from facts that came out of rectification process.

chaos did not help as well.

The main aim of this research is better overview of actual shape of Upper Fortress, so it can help all future planners and designers in re urbanization and revitalization works.

All research works on paleo-genesis, urbanization and urban development for Town of Herceg Novi was done on the basis of archive resources. Those resources were from various authors, writers from past and current times. Also, some resources were from archeological facts on architecture monuments through the rectification of the old towns.



Figure1. The sustainable function into architectural heritage. (Source: Brunetti O. 2008.)

## 2.0. Urban genesis through rectification of old plans

### 2.1. Phase One

Natural condition explains topographic characteristics of location on the south side that it has very high slope, important points, and springs of drinking water, No evidence that was any construction on this site before 1382.

## 2.2. Medieval Upper Fortress /1382 to 1482/

Research of this period of establishment of Herceg Novi, by Tvrtko decree is very important, because it was the first urban cell. Later under the rule of Herceg Stjepan Vukcic Kosaca, became a real urban settlement, and this is important for research of Upper Fortress – Spagnola.

During the 15th century urban development the greatest merits goes to Herceg Stjepan Vukcic Kosaca. He built or rebuilt the town on today's location, giving new character to this settlement, together with being a town for armed forces. He expanded commercial activities by opening craft workshops.

The paragonal analysis of urban genesis of both urban structures, The Old Town and Upper fortress-Spagnola, discovered that the first indication of Upper Fortress on present location was in 15 ct.[2]

## 2.3. Upper Fortress under Ottomans /1482 until 1687/

Turks conquered Herceg Novi for the first time in 1482, without battle, and exactly 100 years after Tvrtko's establishment of Herceg Novi. The historical period of the first 100 years defined medieval urban structure of Herceg Novi. A lot of archive data and facts about structure of the town is possible to find / Dubrovnik archive etc../. From Sandalj Hranic and especially from Herceg Stjepan Vukcic Kosaca rule period of 15st. it is possible to find information about continuous urban development of Herceg Novi.

There are no old drawings, so architect volume and looks are not clear. The question is what type of town Turks conquered without battle in 1482.

According to written archive facts, the last Bosnian ruler Herceg Stjepan had a Court building in Town, received audience, signed commercial contacts, resided, and he also had his professional armed forces. He died in Herceg Novi.

In August 1539 the Turks conquered Herceg Novi and surrounding area under command of admiral Hayredin Barbarosa. The first mention of Upper Fortress, as an important defense structure under the name of Carlo V, or Spagnola.



Figure 2. Castello, Herceg Novi, 1539, god. Montenegro i forteza Carlo V Capua, 1542.god. Italia.  
(Source: Brunetti O. 2008.)

Rather, explanation could be that really it was reconstruction, and additional works on some existing structure. Also, it is very important to mention, that Carlo V and his admiral Andrea Doria, were economically speaking very equipped by South American gold conquistadors, for financing all campaigns against the Ottomans. So, the Upper Fortress could have been built with good financing in that period, and in continuum of its urban development could reach a better level of urban and defense importance.[2]

It can be confirmed that Turks, while ruling from 1539, recognized strategic position of top hill point for defence purpose, and they immediately started doing all necessary reconstructions on old Spanish structure, through rebuilding and adding new structures.

To Upper Fortress the fourth tower has been added and some parts of eastern and northern walls, probably after earthquake of 1563, and for sure at 1572

It can be concluded that rectangular Upper Fortress was possibly constructed during Sultan Suleyman period /1520-1566/, based on stone plate description which was presented above the old entrance.

#### 2.4. Venetian „Castell Sulimanego“ /1687 until 1797/

The urbanized structure of Venetian Castel Novo was traditional of Turkish streets and squares. This structure is present until today. Some of the old streets are lost, instead they became gardens. Along the east rampart, on it's town side, with inner gate in medium rampart wall, which connects lower town („Citta bassa“) area. On the lower square (Sv.Jeronim), compared to today's look, there was different regulation line of the blocks, /mosque and past church on the same place/. The same situation is on the upper square („Belavista“).



Figure 3, Simone Pinargenti, „Isole che son da Venetia nella Dalmatia“, Castel Novo, published 1573.god. Venice, (Source: Brunetti O. 2008.)

„Fortezza di Gornji grad“, is urban structure heritage from Turkish period. Naturally, the Turkish mosque was transformed to church. It is important to note that this small church was used for service for people and staff of Upper Fortress.



Figure 4. Francesco Camotio, Castel Novo, published 1572.god.Venice PRM, (Source: Brunetti O. 2008.)

#### 2.5. „Spagnola For“ under Austrian/Austro-Hungarian/ rule /1797 until 1918/

Accepting the peace treaty in Tilzit in 1807 Russia had to surrender Boka Kotorska to Napoleon, so Montenegrin ruler had to retreat to Montenegro. With final defeat of Napoleon in 1814 Herceg Novi came under the Austrian and later Austro-Hungarian rule.

All these historical facts leave structural causes on Upper Fortress, as very important military strategic hill point. In 19th ct. there were a lot of structural changes moving traditional urban structure as it happened with most coastal towns, but it was not case with Upper Fortress-Spagnola Herceg Novi.



Exactly that inaccessibility and determination of secret military strategy, saved shape and structure of Upper Fortress form, from the first years of 17th. up till today. The first „opening“ to the public was in 1970s, because until that time the property has been registered as the „military secret“.

Some of inner buildings are modified, some reconstructed or constructed on the basis of old foundation, but with modern building materials, and some of them got a new function. Important works have been done outside of Upper Fortress, such as secondary defense eastern wall and outside underground water tanks, cistern. The Upper Fortress was equipped with modern technological and strategic artillery systems, bunkers. New entrance to the complex is indicated. In that time new access road from northern side has been built, becoming the main strategic access road for whole complex.

Under the Austrian/Austro-Hungarian rule Upper Fortress-Spagnola, become as never before, very important military strategic point for complete defense system of Boka Kotorska bay. It is very important to note that at the end of 19. ct. (probably 1857) when there were active construction works in area, there was intervention on northeast Tower which „opened“ a new entrance to complex of Upper Fortress-Spagnola. This intervention violated authenticity of Upper Fortress. The entrance became the main gate, and the old one was closed.

## 2.6. Contemporary Upper Fortress Herceg Novi/1918 until 2010/

After The WWI in 1918 in the new state of Kingdom of Yugoslavia, there is stagnation regarding urban development of Herceg Novi. The population which was part of economic growth potential, started to move from Old Town to suburbs where they found better living conditions and benefits from upcoming industrialization.

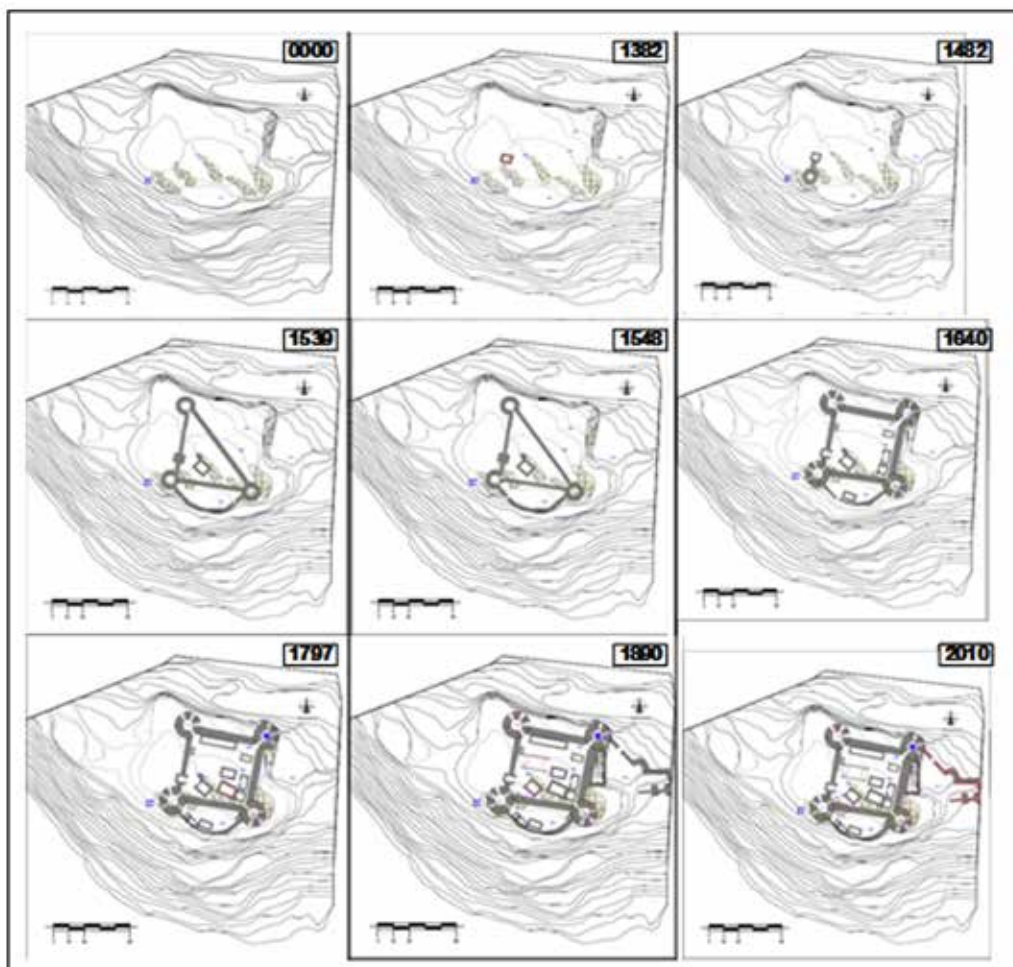


Figure 5. Upper Town Herceg Novi, Urban genesis, (Source: Brunetti O. 2008.)



Figure 6. Upper Town Herceg Novi, Urban genesis 3D, (Source: Brunetti O. 2008.)

After WWII, in 1945, the Upper Fortress-Spagnola was in even worse conditions, an following that was slowly abandoned. The reason for abandoning was development of a new missile defense technologies, and here classic artillery system was not useful any more. Also, the second reason for abandoning was a bad sociological planning system and the worst relation and preservation of this urban and architectonic monument heritage site.

All military and public functions of Upper Fortress were lost and non-indicated owner status made devastation of this structure even worse. The property was declared as military property until 1970s, but not for use from 1945. So, it was not possible to do any reconstruction or revitalization because it has been declared „blocked property“. At last, catastrophic earthquake in 1979 in the area, pointed to the problem of revitalization of Upper Fortress, as monument heritage site. Once again, this urban structure has been omitted from any activity and funds for reconstruction of the monument heritage in this area.

### 3. Analysis of current Upper Fortress architecture

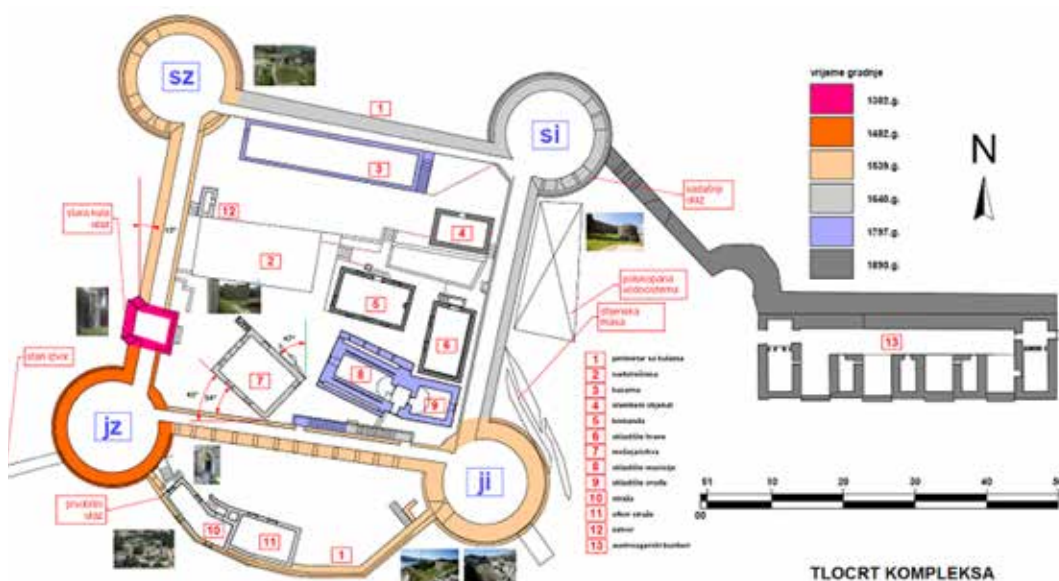


Figure 6a. Upper Fortress (Source: Brunetti O. 2008.)

The actual state of the urban structure, rampart walls, towers is devastated and in very bad conditions. Inner structures are roofless, devastated houses. Outside of rampart walls there are high citrus and pines trees, planted around the fortress in 1960s. Today that greenery physically and architecturally devastates Upper Fortress. Bad planning approach in the past resulted in new individual dwellings, which cover historic profile of Upper Fortress- Spagnola, and urban profile of the slope of the city Herceg Novi. There is a certain number of buildings or constructions which made urban structure of Upper Fortress: 1.- *Defense rampart walls with towers*, 2.- *Shed*, 3.- *Barrack*, 4.- *Dwelling house*, 5.- *Dwelling house-command*, 6.- *Food deposit*, 7.- *Sacral building/mosque*, 8.- and 9.- *Munition and equipment storage*, 10.- and 11.- *Guardian and guardian app.*, 12.- *Prison*, 13.- *Austro-Hungarian bunkers*. [2]

#### 4. Rehabilitation

The location and space capacity of current mini urban agglomeration Upper Fortress-Spagnola, Herceg Novi, in today's urban surrounding, opens the great challenge for all planners, urbanists, architects, functionalists, heritage specialists. That challenge is to re-urbanize, and revitalize Upper Fortress-Spagnola, as specific urban functionality. It is not a disputable question if this urban structure needs to be revitalized. Essential question is, for what functionality, and under which special monument heritage conditions, during planning for this area will be applied.

In order to define these conditions it is necessary to create, and this is the routine work of conservators and heritage specialists of heritage sites under international conventions, a clear methodological matrix of previous planning activities. Therefore the research matrix has included: Urban genesis; chronological and stylistic analysis; probing archaeological research work; architectonic drawings of existing structure; photo documentation and videos; detailed descriptions of actual state of structure and infrastructures capacity; and valorization of the complex at whole and its components

From above noted research works, new information will be expected useful to open a new planning approach for urban planners regarding definition of new technical documentation for revitalization of this structure. The final document which will help planners, will be „Urban conservation conditions“ for development of new technical documentation, and that document must be issued by the State institution.

Useful information are possible to find through comparative analyses of the Upper Fortress of Herceg Novi with similar fortresses built by order of Spanish King Carlo V, [3] in the Mediterranean area between 1530 and 1552 (in Italy: Salento and Lecce, Galipoli Puglia 1549) today has a cultural function. Crotone, Calabria, currently it serves as archaeological museum.



Figure 7. Urban miles southwest side of the Upper Town, snapshot, 2010. (Source: Brunetti O. 2008.)





Figure 8. Urban mile unplanned or illegal building on the southwest side of the Upper Town, snapshot, 2010. (Source: Brunetti O. 2008.)



Figure 9. Dormant potential of the area of the Upper Town, snapshot, 2010. (Source: Brunetti O. 2008.)

Capua, Campania, Caserta 1542 –in the military function today; Monopoli, Bari, Puglia, Aquila, Abruzzo-renovated and today there is National museum of Abruzzo; and Goleta, Tunisia, Tunisia and Stari Grad, Hvar, Croatia -serving as the defense system in the wars with Ottoman, indicates many similarities, especially. The most emphasized similarities are between Upper Fortress and the fortress in Capua.[4], [5]

## 5. The principles for rehabilitation of Upper Fortress- Spagnola, Herceg Novi are .

### 5.1. Positive energy location for users

To be a „good vibration“ area, this complex, in its macro and micro urban system needs to be, comfortable, full of security, with diversity and attractive. For mentioned attractiveness great potential exists. This area needs to be distinctive fun and to offer a lot of various possibilities to customers. As re-urbanized area it can offer to people possibilities for meetings, contacts and identification with specific parts of the area, enjoying the socialization. The urban context has essential importance. It is a character by itself and existing structure needs to be realized. It is of made of history, urban structure, ecology, archeology, exact location, inhabitants, and people who live around it. To understand urban context, is the starting point to make technical documentation for revitalization of the Upper Fortress-Spagnola that make it special.

### 5.2. Positively enrich the existing shell of monument heritage

All planned interventions need to enrich this micro urban area. This is meant to motivate specific answer, which is interpolated from the environment in a positive story, correlating with it. This applies to all urban elements: city, town, and neighborhood.

### 5.3. Communication of the location

As re-urbanized and revitalized, the area of Upper Fortress-Spagnola, needs to be very easy to reach, and to physically and visually fits with the surrounding. In inner area, and outside of it good organization of people, cyclists, public transport and cars needs to be well defined always with precedent to the pedestrians.

### 5.4. Landscape dialog

Thinking about landscape dialog and balance, it needs to use all benefits from urban historical complex, all countryside and ecological values, because of good energetic efficiency and comfort.

### 5.5. Functional diversity on existing structures

As always, the most inspiring and comfort areas are those who can perform on wide wishes of the consumers. In such areas various objects have been successfully incorporated.

### 5.6. Investment management in revitalized structures

To accept planned urban design, projects must be economically sustainable and well managed. All market moves, long period of local community interest, and very clear method for execution of re-urbanization and revitalization process, as planning and designing is need to be understood

### 5.7. Planning and designing for changes

The revitalized areas need to be flexible, so that they can receive any further changes to the functions, methods of use and socio-urbane changes too. This requires, through re-urbanization and re-vitalization, planning and design, efficient use of energy and resources, flexibility of use of land and inherited structures and infrastructure, with the possibility of allowing new technological solution for access for mobile means of traffic.

## 6. Conclusion

- The rectification of old drawings and plans is very important research methodology, because as relatively new method it can offer new information regarding urban development.
- The publication or issue date of old plans or drawings from 16th and 17th ct. do not declare the date of produced design on the location, and really it can be almost 50 years before it was published
- The surrounding area of Herceg Novi has been recognized for military defense functions. The earliest tower on location of Upper Fortress-Spagnola, presented in some old vedutas was rectangular shape construction with defense crown on the top.
- The old plan, or drawing issued in 1595. by Barents, probably done by sketch from cca.1535. clearly defined beginnings of Upper Fortress-Spagnola, the strong quadrangular tower with defence crown. Under the Turkish rule period close to 1535 exists the first information regarding Upper Fortress-Spagnola construction.
- Triangular footprint Turkish fort above the city was reconstructed based on Spanish buildings, constructed by Andrea Doria order desig/very probably done by Antonio Ferramolino - spanish: Hernan Mulino, autor of Revelin fortress in nearly Dubrovnik from same period/ between 1539 and 1551.
- The Upper Fortress-Spagnola, definitely it can be concluded that quadrangular shape was constructed between 1563. /big earthquake/ and 1572./siege of Herceg Novi by admiral Venier, presentation of quadrangular shape fortress by Camotio/.
- From southwest, outside of fortress, there was a smaller public facility, behind drinking water spring. It was han, and later metoh, as nucleus of suburb of Upper Fortress- Spagnola.
- As it is possible to be noted from all later, Venetian period drawings, and maps, the

Upper Fortress-Spagnola, in its present conditions has authenticity from 16th.

- Geomorphological determinations, and also functionality request by the certain time period, determined specific urban system of the Upper Fortress-Spagnola, and because of that inner communications paths, streets have specific character. The Mosque has different regulation than rest of the complex, and that is because it was oriented towards Mecca.
- In order for this complex to have „good vibrations“ in its micro and macro urbanistic system, it must be comfortable, safe, diverse and attractive. It has great capacity to become this. It needs to be unique, joyful, and to offer a lot of possibilities to customers. Re-urbanized areas offer possibilities for human contacts, and great socialization. The urban context is very important, and understanding that is nucleus for making good designs and plans for revitalization of this structure.
- To have successful revitalization of the property, it is necessary to provide flexible conditions social and functional changes.

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# Architectural interventions on buildings of architectural heritage intended for persons with diminished physical abilities

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## Abstract

Protection of architectural heritage, is a very complex and sensitive process, which changed through history, evolving to contemporary methods and doctrines.

Today, the most advanced method is believed to be active protection of architectural heritage. It implies the revitalisation of historical monuments through their recovery with some of the well known methods of preservation and providing them an appropriate new function. Goal is to make them self-sustained and to bring them into a proper and regular maintenance.

To accomplish that, the current doctrines of protection allow interventions of certain extent, type and quality, to create a new authenticity. They should enable establishment of new function and its further proper conduct. They imply adding new values, new historical layers to the monument, which is why its value and usefulness increase, rather than reduce. Accessibility for people with disabilities – especially wheelchair users – has been disabled for a long time, given the history of protection doctrines, which did not allow any meaningful or any other interventions on historical monuments. Active protection has allowed creative complementing of architectural heritage, which, along with ever-growing demands for equalisation of rights for disabled persons in all segments of life and work, has opened a perspective of definite and quality solving of this problem. It, however, except in rare cases does not happen yet. The reason for that is the ambivalent attitude towards the people with disabilities, whose auxiliary products for walking are considered to be something that can not be called with a term of new authenticity or new historical layer on a monument yet.

When the position of truly powerless equalize in all segments with the position of healthy ones, even in the above mentioned, accessibility to architectural heritage will be also practically solved. For this purpose, the necessary theoretical assumptions have already been absolved.

Keywords: *architectural heritage, preservation, disabled persons, human rights, accessibility*

## 1. Introduction

Architectural heritage is a cultural good of all mankind.. It implies architectural achievements of town planning, , architecture and engineering from prehistory to the present. Relationship to the architectural heritage has not always been the same as today. By awareness increasment of its importance, its definition has changed, and therefore its content.

Architectural heritage, like everything else, is a subject of aging and degradation. Both processes will cause great losses, damage its integrity and authenticity, and ultimately lead to its complete destruction [1].

Architectural heritage degradation can be natural, and caused by people. Recently, the Organisation of United Nations is trying to cope with all kinds of degradation of architectural heritage, but also to find most efficient ways of its permanent protection [2].

Regarding this, it should be mentioned that providing access to persons with diminished physical capabilities, especially wheelchair users to these historical constructions, long time has not been recognizing as a problem of any kind. Therefore, this issue was not discussed. In moments when first requirements for solution of this problem appeared, the prevailing opinion was that interventions aimed in that direction, as well as any other, would represent the particular type of degradation of architectural heritage.

The protection of the architectural, cultural and natural heritage, is a complex and sensitive process, which has changed ture history, evolving to modern methods and doctrines. The science of preservation of architectural monuments, like any other science, has progressed over time and today has reached such a level of development that allows the opening of the theoretical debates on this topic and finding appropriate - adequate and quality solutions.

A number of small, mutually independent attitudes, eventually led to relaxation of rigid views on the protection of architectural heritage, which were represented by John Ruskin or Camillo Boito. These relaxing attitudes were often incorporated into "hard" theories of protection. Even one of the basic theoretical demands of Camillo Boito, one for the distinction of added parts from the original, can be, since it allows new, added items to a historical monument, be interpreted as one of those relaxing attitudes.

This issue has been recognized by contemporary architects, who developed teory of new authenticity. Andrea Bruno, Jean Nouvel, Daniel Liebeskind, Sir Norman Foster have proved with their numerous, from the professional and the general public very well accepted projects, that implementation of new authenticities within the process of active protection of the architectural, cultural and natural heritage does not harm them, but creates new total values.

Their, as well as the opinion of their followers, relying on the attitudes of the Venice Charter - which recommended the activation of historical monument by giving it the original or complementary functions - as well as on the attitudes of the Amsterdam Declaration - which requires that new facilities, in this case new autenticities, as future heritage of tomorrow, are made in high quality - has opened the way for new, creative attitude towards heritage of the past. It made it possible that new authenticities can be considered as one of the layers in a total lifetime of a historical monument.

The doctrine of new autenticities also opens the possibility of convergating requirements for enhancing the protection of the architectural, cultural and natural heritage, that seemed to be conflicted until recently, on one hand, and enableing access to persons with diminished physical abilities to that heritage, on the other. Theoretical development of architectural heritage protection led to loosening rigid philosophical views. It was a natural sequence of events, which were result of long-term maturation of doctrinal views, and not a desire to provide any benefit to anyone including persons with disabilities.

Today, the most advanced, as believed is so called active protection of architectural heritage. It implies revitalization of historic monuments through their recovery with one of well known methods and assigning them appropriate functions, trying to get them to be self-sustainable

and brought into the process of regular maintenance. To accomplish that, current doctrine of protection allows certain interventions of certain size, type and quality, in order to create a new authenticity[3]. The concept of authenticity means that all architectural goods, nominated for entry into the World Heritage List on the basis of criteria for the assessment of outstanding universal value, must meet the criteria of authenticity [4].

Active protection includes the preservation of authenticity and integrity of monuments. In them it sees exhibits of different traditions, which complement each other. Therefore, it insists on the richness of diversity, which leads to natural, conflict-free interpenetration of old and new and to creating an environment in which the fostering of own identity will be one of the basic social qualities.

It is obvious that the constant evolution of the overall philosophy, and particular doctrines and methods of architectural, cultural and natural heritage protection inside of it, spread in the form of a wider range (Fig. 1).

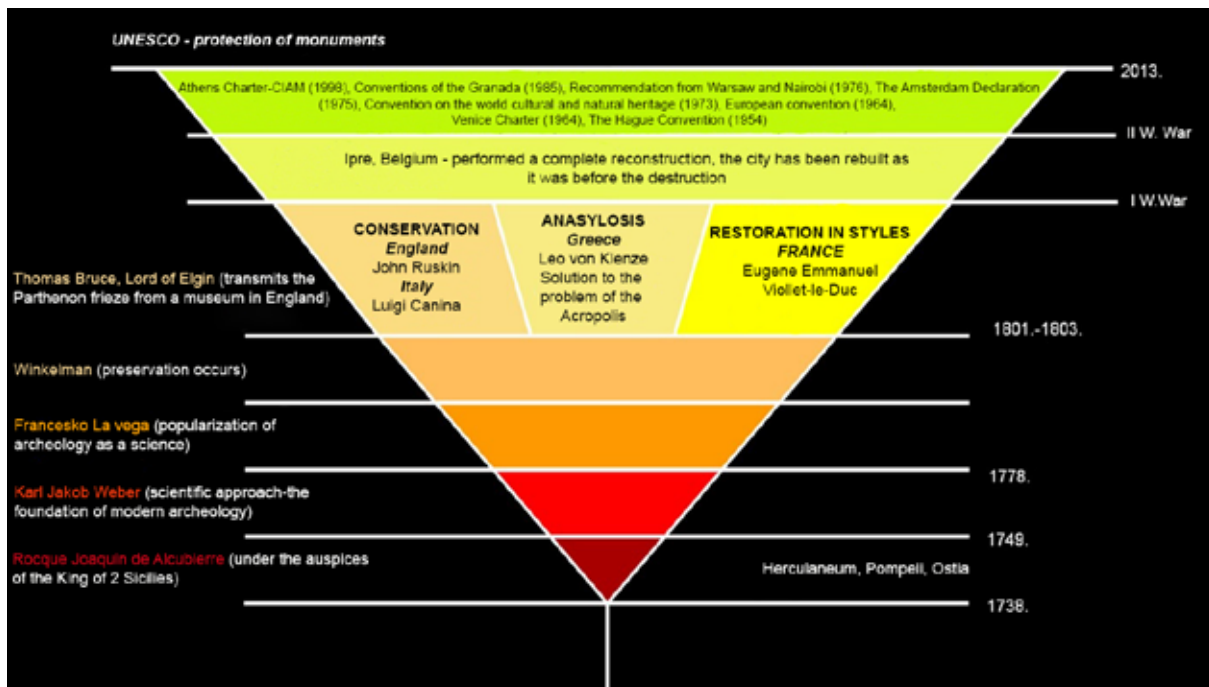


Figure 1. Evolution diagram of architectural heritage protection (Source: Illustration by the author of the article)

## 2. Disabled persons

Disabled persons are people whose organism are not functioning properly, because of certain physical, mental or functional defects [5].

Science of the history of our civilization has evidence on which it can be concluded that people have always suffered from most diseases that they are suffering today, and which always left or didn't leave the same consequences on their organisms. Patients tried to reduce pain and physical weakness in different ways, just like they do today, on one hand and increase their mobility and independence, on the other.

To treatment of patients was always paid a proper attention. Hospital facilities have very long and very rich tradition [6]. Unlike, protection of persons with diminished physical possibilities was never institutionalised, until the early fifties of the twentieth century. The problem has been reduced to individual action, or individual approach to the problem and to finding solutions within their own possibilities. That is the reason why about society care development for physically disabled can be spoken only conditionally and through the prism of individual examples i.e. independent efforts to realize any mobility by making rough, improvised orthopedic devices, which often could not answer their main task - achieving independence in movement.



As public awareness for equality between healthy people and people with diminished physical capabilities grew, so grew the request for devising means which would allow independent mobility to immobile persons.

General acceptance of the fact that people with reduced physical capabilities should be as far as possible independent, and that they should be active participants in all social events, reflected in the philosophy of designing orthopedic devices. They were now made of expensive lightweight materials such as aluminum, carbon, titanium.

Inclusion of persons with reduced physical capabilities in all life courses resulted with appearance of special assistive devices, i.e. industry that deals with their production. In fact, goal is to provide fully independent mobility for immobile persons.

However, the current level of technological development indicates that the current solutions to the problem of mobility of persons with disabilities should look for solutions within the conventional technology, where ordinary wheelchairs and what can be individually done with them are the most important independent references. Current level of development and basic characteristics of assistive devices are important, because the type, scope and nature of the procedure that needs to be done to make heritage buildings accessible.

The social significance of equal treatment between persons with disabilities and healthy people was not even recognized until fifties of the 20. century. To the objective and subjective physical difficulties, needs and requirements of the powerless was not paid much attention, nor attributed essential importance. They were left alone to themselves and to their closest surrounding to cope with them.

Over time, and due to the increase in living standards, awareness of the equality of all people, primarily in developed countries, yet awakened. It resulted in efforts to provide persons with diminished physical capabilities fullest possible integration into society and its courses.

So, in the same way as the doctrines and methods of conservation of the architectural, cultural and natural heritage have developed, so did guaranteed rights of persons with disabilities (Fig.2.).

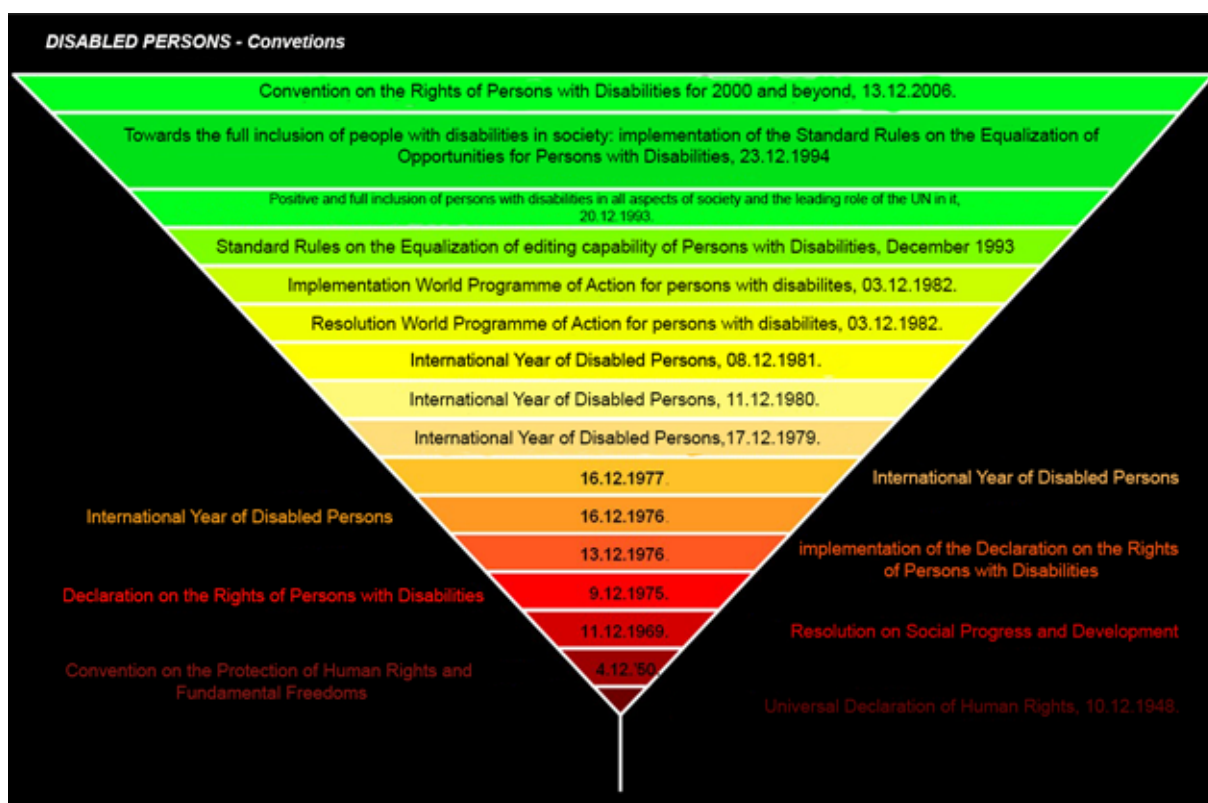


Figure 2. The expansion diagram of guaranteed rights of disabled persons (Source: Illustration by the author of the article)

### 3. Architectural heritage and disabled persons

Accessibility for persons with disabilities, especially for wheelchair users, given the history of former protection doctrines, which did not allow any meaningful, and some of them even any intervention on historical monuments, was disabled for a long time.

The theories of protection in general, were not sensitive when it comes to people with diminished physical abilities. However, it was not intentional. The accessibility problem for persons with disabilities to this category of objects, had not been detected, nor were the experts aware of its existence. That is why there weren't any conscious and targeted activities to overcome this problem.

When it comes to the mutual relationship between architectural heritage and the rights of disabled persons, the present moment is characterized by very unclear and even less defined situation. The United Nations promote equality of all people as the greatest possible universal value, and it should be subordinate to all other spiritual and material values.

On the other hand, the United Nations insisted on giving greater importance to architectural, and other heritage, with the recommendation to make it self-sustaining. This resulted in relaxing of hard attitudes of the untouchable architectural heritage, as well as in emergence of new doctrines of its protection, especially of the new one, which is called the active protection. Within these overall activities, new theories about the new authenticity and reversible additions came up. They opened theoretical assumptions for possible interventions on the architectural, cultural and natural heritage, and without causing it any threat.

Over time, methods and doctrines of protection, as well as the rights of disabled persons have evolved parallel and in the form of a fan. The end of the XX and beginning of the XXI century is a time in which the space for independent expansion of these fan ran out. First they had to touch, and then continue to develop together (Fig.3.).

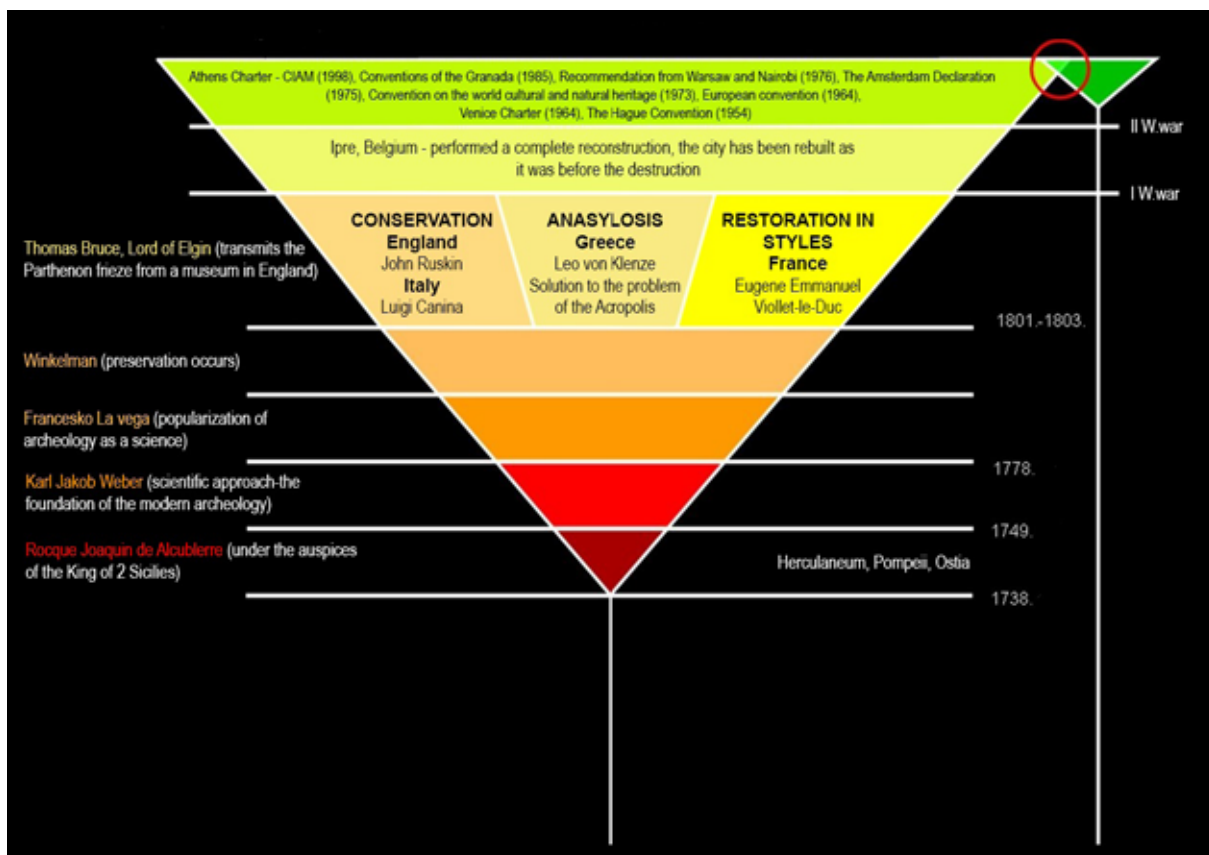


Figure 3. Synergy diagram of architectural heritage protection and guaranteed rights of disabled persons  
(Source: Illustration by the author of the article)

The results were improvised attempts to provide access to historic buildings for physically disabled. Access slopes, stairs and platform lifts were made in inferior quality materials, without concern for aesthetics and design, and even without the full implementation of standards that enable the realization of the basic requirements that are related to their independence.

Active protection allowed the creative topping of architectural, cultural and natural heritage, which, along with the ever-growing demands for equalization of rights of persons with disabilities in all aspects of life and work, opened the perspective for definitive and quality solving of this problem. However, except in rare cases, it still does not occur. The reason for this is still ambivalent attitude towards persons with diminished physical capabilities, which aids in the movement are still considered to be something that can not be called a new authenticity or a new historical layer on a monument.

Active protection already demonstrated its full capabilities during the seventies of the twentieth century. Unlike the previous doctrines of preservation of architectural heritage, it treated all historical layers equally. However, if necessary, and if it increases the value and importance of the monument, it allows and highlights only one of the present styles or even just one of the details [7]. Giving a function to the monument, its inclusion into current trends of life is possible through the process of revitalization, and is still considered to be the most effective method of protection. Installation of the most modern equipment in historical buildings can be viewed in two ways. They can be seen as a new historical layer added to the one that is already existing or created as a new architectural authenticity. This shows that the protection of architectural heritage is not a static category, it changes and evolves in the direction of loosening the strict discipline that was once advocated and largely imposed by advocates of conservation and related preservation doctrines. One of those who is practising the active protection in such manner is Andrea Bruno [8].

Today, the rights that the law guarantees to persons with diminished physical abilities greatly expanded. Simultaneously, theoretical doctrinal beliefs about protecting the architectural heritage extremely thrived. It is clear that solutions for the approach to historical monuments can not be improvised any longer. All its basic characteristic, such as: doctrinal approach to the problem, idea, creation, contextual relationship to the existing, have to be on such a level, that they can be considered as a new authenticity.

Adding new authenticities to architectural heritage has already been accepted and fully established by the experts. It opens the door to a particular type of intervention, regardless of the age, value and type of heritage. Improvised solutions should be replaced by the theory of (quality) reversible attachments or by the new authenticities. It is necessary to adjust the normative acts, as well as to clarify the achievements of pre-existing doctrinal positions on the protection of architectural heritage.

The issue of access for disabled people to any type of buildings at elementary, ie. Technical-normative and functional level has been dismissed. However, when it comes to heritage buildings, there is an additional, much more complex level. It requires a decision by which principle to be guided in choosing the right solution for the approach to historical monument.

In order to reach a decision closest to the optimum, it is possible to recommend the methodology of its adoption [9]. The methodology begins with defining problem solving strategies, which consists of several elementary steps (Fig.4.).

The first stage is the identification of problems, i.e. establishing of the fact that a particular object of architectural heritage does not have access for persons with disabilities.

After confirming the existence of the problem, it is necessary to define goals, but within certain limits. This limitations do not apply to certain groups of disabled people, but to the parts of the object or group of objects that the request for full accessibility for objective, primarily technical and technological reasons, could not possibly cover in any way.



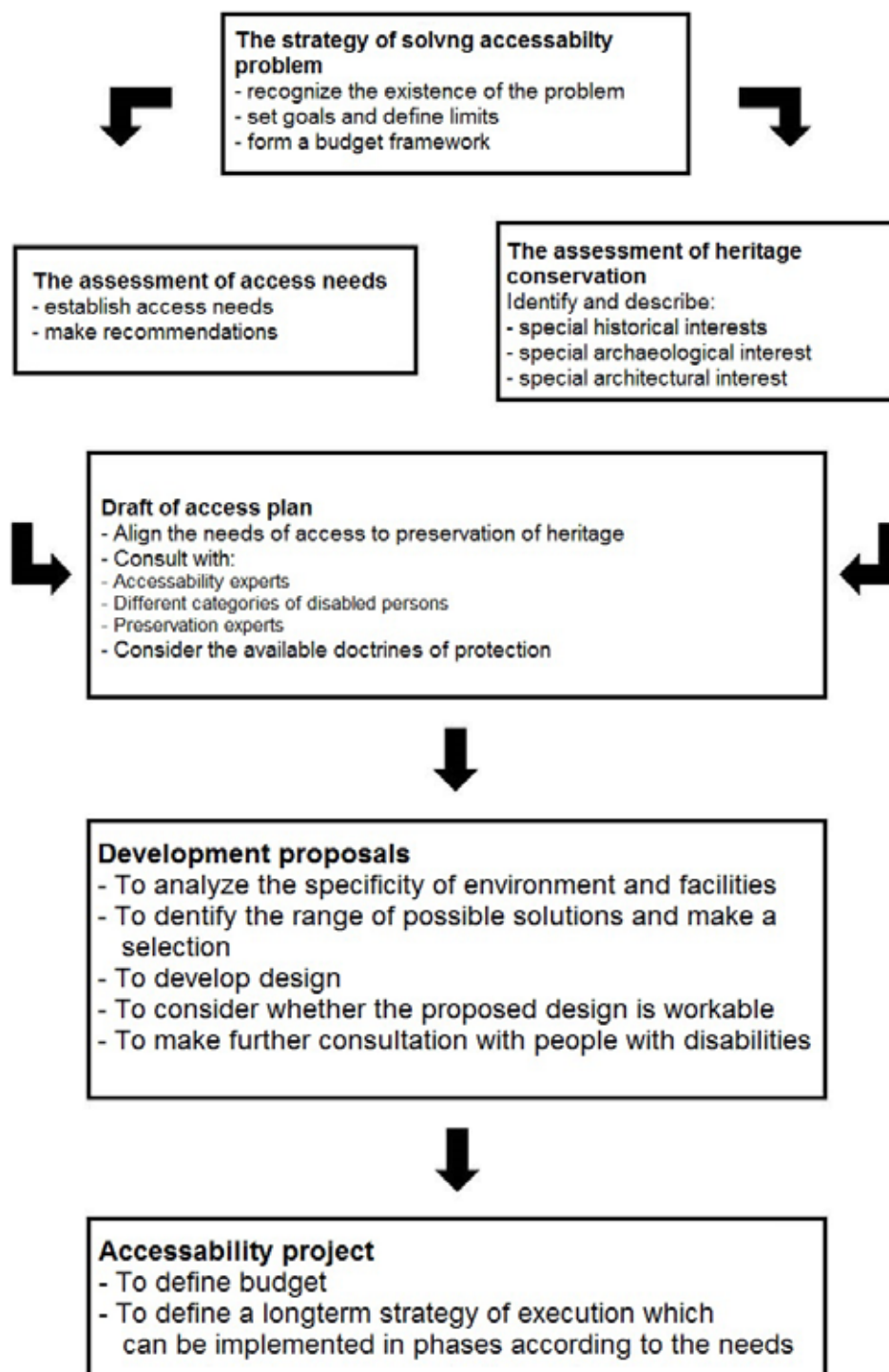


Figure 4. Methodology scheme of deciding to take the request in order to realize the access to architectural heritage[9]  
(Source: Sawyer, Ann: *Easy Access to Historic Landscapes*, Swindon, English Heritage, 2013, str. 47. - Edited by the author of the article)

After defining the goals, it is necessary to make approximate calculation of works due to the formation of the budget. No pre-allocated funds would be very risky to indulge in any actions, because unplanned interruptions of work can cause serious damage to the heritage.

The next steps are a lot more specific and focused in two directions. First one would consider establishment with the essential need for access. The next phase is the phase of defining the procedures that could be allowed, intervention that could be allowed by a compromise, as well as those that can not be allowed in any way. The most sensitive phase, would certainly be defining

a basic protection doctrines to approach the problem, where any possible errors could be of fundamental importance. Next very sensitive phase, essentially dependent on the previous one, would be design of basic ideas and development of appropriate design.

Finally, it should be noted that these studies, treated special, so far in the professional literature unexplained aspects of issues related to architectural heritage, but also details of issues related to persons with reduced physical capabilities. They lead to conclusion that the recommended interventions on architectural heritage, which are done in order to improve the quality of life and to realise guaranteed human rights of persons with disabilities, can be implemented without compromising its authenticity and integrity.

#### 4. Conclusion:

Doctrines and methods of protection of architectural heritage improved true time, so have the the human rights and requests for equality between healthy and disabled people. Current doctrines and methods loosen former rigid attitudes and now allow certain interventions, creating new authenticities. These can be seen as a new layer on a historical monument, which will make the objects of architectural heritage more functional and enable independent movement of disabled people.

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# Implicit Actors of the Urban Development of Istanbul: Non-Muslims

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## Abstract

During the Ottoman period, Istanbul was one of the most cosmopolite cities of its time, having been the capital of different cultures. Particularly with the urban structure formed after the 18th century, Istanbul embodied both the urban elements that were continuance of the Byzantine period and the formations peculiar to the Islamic Medieval period, and constructed the modern period's components on top of these. Istanbul, where different groups acquired their national identities and expressed it in the urban context, exhibits a wide range of urban constituents even today.

The article evaluates the distribution of non-Muslims in Istanbul and their role in the urban formation of the city throughout the Ottoman rule. Starting with the Ottoman rule in Istanbul, in accordance with the city's extension, the locations the non-Muslims were living grew. With the introduction of Muslim neighborhoods to the city, some non-Muslims' neighborhoods were moved to other locations.

The 19th century was an era of reforms both in administration and social life. During that period, with the effects of industrialization in the Golden Horn Area, the emergence of a bourgeois middle class and introduction of new types of buildings like summer houses and embassies in Pera and Bosphorus coast; the city's looks started to change. The non-Muslims had become the transmitters of the novelties of the period and became effective in planning of social and communal institutions on education and service. The urban effect of the reforms was to transform Istanbul from an Ottoman-Islamic city to a more cosmopolite city that was designed with methods adapted from the Western models. During this transformation, the non-Muslim and foreigner architects became distinguished. It is vital to understand the role of these implicit actors to have a full view on the history of Istanbul.

Keywords: *Ottoman architecture, Istanbul, non-Muslims, social geography*



## 1. Introduction

Ottoman citizens who were not Muslims were given a special name, 'gayrimüslim' (non-Muslims) in the traditional Ottoman system. In the Ottoman administrative structure, they were called as 'millet-i mahkûme' (captured nations) or 'zimmi' (non-Muslim subjects). According to the 'millet' (religious communities) system, the non-Muslim Ottoman citizens were composed of three millets: the Ethnic-Greeks, Armenians and Jews. Some of the subgroups of these millets have formed the nationalities of Balkans today. For instance, as Serbians and Bulgarians were included in the Ethnic-Greek millet, in a similar way Assyrians belonged to the Armenian millet. The settlements of these millets in Istanbul, their social status and their effects on the urban space will be discussed in the paper.

As Cerasi [1] stated, the Ottoman State embodied different urban models due to its wide geography. The most significant of these are the Mediterranean model in the South of Greece, Seljuk and Armenian model in the East Anatolia, and the Arabic model. Today the cities which are referred as acquiring "the Ottoman model" are the ones in the Marmara region, North-east Anatolia, Macedonia, Bosnia and Herzegovina and Bulgaria. These cities have emerged as a synthesis of Turkish, Greek and Slavic culture. The main characters of this model can be presented as the coexistence of the monuments and several urban elements dating back to the foundation of the city, the complexes of the Ottoman Classical period with residential areas and bazaars emerged around them. [1] Istanbul is the most developed city of this model, having been the capital of different cultures. Particularly with the urban structure formed after the 18th century, Istanbul embodies both the urban elements that are continuance of the Byzantine period and the formations peculiar to the Islamic Medieval period, and constructs the modern period's components on top of these. Istanbul, where different groups acquired their national identities and expressed it in the urban context, exhibits a wide range of urban constituents.

## 2. Populating the City After the Conquest

After the conquest of Istanbul in 1453, one of the first attempts was to increase the population of the city. As a sultan of a multi-cultured state, Mehmed II decided to bring artisans and tradesmen from different regions and ethnicities. Even though various ethnic groups have been living in Istanbul, it was after the conquest that the city started to acquire its cosmopolite character. Although Muslim groups were invited to Istanbul as it was going through the process of transformation to an Islamic city, immigration of non-Muslims was demanded as well. It was obligatory for every conquered region to send at least 100 artisans and wealthy families, thus obtaining a qualified urban population was aimed. Within the first 25 years after the conquest, 60 to 80 thousand people were settled in Istanbul. [2]

After the conquest not only did the number of citizens increase, the urban structure started to change as well, as the Islamic city brought along some new schemes. Every community lived in their own quarter organized around a mosque, a church or a synagogue and had their own cemeteries. The main reason for this separation lies in the Sheria rules<sup>1</sup>. According to the rule, it was forbidden for the non-Muslims to perform their rituals or ceremonies within the sight or hearing of the Muslims. With the same manner, they were not allowed to do constructions around a Muslim religious building. As in all of the Islamic cities, the residential districts were separated from the commercial areas in Istanbul. Even though there was not a distinction apart from the food sold in the bazaars, non-Muslims were not allowed to establish shops selling illicit food or drinks in the Muslim quarters. [3] Although there were strict rules about the drinking houses' locations, through archive documents it is known that they were widely spread around the whole city, but were mainly located in Galata and other non-Muslim dominated areas.

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1 Moral code and religious law of Islam based on the Quran and examples set by the prophet.

According to Yerasimos [4] after Istanbul became the capital, massive numbers of people from different ethnicities were moved to the city: communities from Mora and Greek Islands; Genoese from Amasra; Armenians from Tokat, Merzifon, Samsun and Amasya; Jews from Mitras and Sinop; Greeks and Armenians from Trabzon; Muslim groups from Karaman; aristocrats from Athens; Turkish from Tokat and Sivas etc... No principle determines the locations of the settlements of these groups in the city, but it can be said that the city was divided into three main regions: Intramuros, Galata and Üsküdar. [4] After the grave of Ebu Eyyûb el-Ensari was discovered<sup>2</sup>, Eyüp became one of the most important Muslim settlements of the city [5]. Families from Bursa made up most of the residents of Eyüp during that period. Üsküdar was another center for Muslims housing many 'tekke's (lodges) while a small number of Christians were also residing in here. [4]

The mercantile class who were predominantly non-Muslims was settled around commercial areas. Yerasimos depicts the settlements of Istanbul according to ethnicities in the 16th century as follows (Figure 1): The Golden Horn, where the main harbors were located, was the main center of commerce of the city. Many different groups populated the Golden Horn coast lived in mixed quarters. A Latin quarter existed in the Spice Bazaar region. Jewish and Karaites were settled in between Balıkpazarı and Bahçe Kapısı (Garden Gate). Behind these quarters, in the region up to the Topkapı fortress Muslims and Jews were residing. The district between Kral Kapısı (King's Gate) and Odun Kapısı (Wood Gate) housed Jews, Muslims and Franks. Latin and Jewish residences were located in the upper region of Unkapanı. Cibali coast was dominated by the Ethnic-Greeks. Greeks from Trabzon were populated around the Gül Mosque, which was an Orthodox church at that time (Church of St. Theodosia); Greeks from Trabzon and Lesbos were settled in Fener; Greeks and Jews from the Balkans were settled in Balat. Edirnekapi and Topkapı were Ethnic-Greek and Muslim districts. Silivrikapi was a district where Ethnic-Greeks and Armenians resided. The area around the Yedikule Citadel and Samatya were Ethnic-Greek districts. Armenians and Greeks from Old Foça were settled in Kumkapı whereas the rest of the people from Old and New Foça were settled in Kadırga. In the Küçük Ayasofya region there were Muslim and Ethnic-Greek quarters. Byzantium Palace was surrounded by Muslim quarters since the region was the new administration center for the Ottoman State. At the north-east of the Fatih Complex Karamans -Turkish speaking Greeks- were settled. Valens Aqueduct's surroundings and Zeyrek were dominated by Christians. On the other hand, the Ulema<sup>3</sup> had established quarters at the south, north and west of the Fatih Complex. Muslims and Jews from Thessaloniki were settled in Aksaray. [4]

Pera was a region that was dominated by the Latins; however Muslims have started to settle here through time [4] It is known that in 1455, there were only 20 Turkish living in Galata region [2]. The commercial character of the region started to attract other ethno-religious groups. The Galata Port has been Istanbul's major port for commerce with Europe. Merchants from Europe, Venice and Florence always chose to live here along with the Ethnic-Greeks and Jews. This congested port provided a neighborhood that would always be the main source of the cosmopolit character of Istanbul.

As it is seen above, even though there were not walled quarters, the notion of closed community was preserved after the conquest [6]. "15th century Ottoman citizenship is constituted according to professions vertically, and according to religious and communal relations horizontally" [7]. Even though basing the system on professions seem to mean that every group had equal social status, it is known that some groups occupied some professions. For example most of the

2 The discovery of a tomb or a place significant in the history of Islam is a typical motive of the construction of an Islamic city. One of the sahabas (companions) of the Prophet Muhammed, Ebu Eyyûb el-Ensari is believed to be participated in the siege of Constantinople and was martyred here in 672. The discovery of his tomb was based on a dream by Akşemsettin, II's teacher.

3 Religious authority formed by Muslim scholars



Figure 1. 16th century Istanbul according to Yerasimos  
(Source: Cokuras, I.)

merchants were non-Muslims, since they had close relations with European countries, whereas most of the farmers were Muslims.

The social system was formed of four main constituents: 1. Soldiery, 2. Officers, 3. Merchants/Artisans, 4. Peasants/Farmers [7]. If it is reckoned that a non-Muslim could have been an officer if he had converted to Islam, it can be said that any group member could be in one of the stages of the social system. In other words, the social system was not set according to ethnic or religious roots. Religion was not a constant parameter and roots could be ignored.<sup>4</sup>

Non-Muslim communities were provided by autonomy in their internal relations. It is known that Mehmed II signed a debt agreement (Ahidname) with the Genoese of Galata. With this agreement, the sultan ensured their life and wealth safety, thus encouraged them to preserve their existing positions. In this way the status of Galata as the most important center of commerce with Europe was maintained. With the recall of Mehmed II, the Genoese and Ethnic-Greek merchants who ran away during the conquest have returned to the region and got back their goods and possessions unrequitedly. It was also asked from the Galata citizens to choose a chamberlain among themselves [8].

It is known that non-Muslims had the right to choose their own religious leaders, but the metropolit was approved or appointed by the sultan. Mehmed II had introduced a special land tenure system that turned the non-Muslim religious leaders into state's officers. With this system the Patriarchate and Metropolit was responsible for collecting taxes from their own communities. At the beginning of the 19th century, Rabbinate was included in this system. With this practice, a religious authority was reconstructed as an extension of the state. This worked in two ways, providing autonomy to the non-Muslims and guaranteeing the control of the sultan over them. Apart from that, the non-Muslims had their own juridical mechanisms in order to

<sup>4</sup> Most of the Otoman high administrators were recruited boys from non-Muslim families especially in rural provinces in Balkans. They were selected and trained according to their skills. After they convert to Islam and learn Turkish, they would be a part of the imperial institutions. This practice called *devshirme*, has started early in the 14th century and declined towards the 17th century.



solve their internal conflicts. However the right to adjudicate was in the Sheria courts. This brief summary suggests that the non-Muslims never had a total administrative, financial and juridical autonomy; on the contrary they were integrated into a juridical and social system [8].

### 3. Distribution of Non-Muslim Communities in the Urban Space in 17th and 18th Centuries

During the period of Mehmed II, the present buildings in the city were used and not many construction works were done. The main aim was to increase the city's population. Latter sultans undertook the mission of urban development of the city. During the reign of Bayezid II (1481-1512), Selim I (1512-1520) and Suleyman I (1520-1566), the number Muslims in the city increased, thus a need for new mosques had emerged. Some Byzantine churches were converted into mosques and consequently some groups had to change their locations. When the social topography of the early 17th century is studied, new Turkish and Muslim quarters can be spotted. For example new Turkish quarters were established around the Anatolian Fortress, commissioned by Bayezid I (1389-1402), and in Kanlıca. A new Turkish quarter was founded in Istinye, turning the district in a place where Ethnic-Greek and Turkish live. On the other hand, during the period of Murad II (1421-1451), many Armenians from Erivan and Tebriz after their conquest, from Caucasia and Iran, and from East Anatolia after the Celali Rebellions were brought to Istanbul. In general, the Armenians lived in small groups between Edirnekapi and Topkapı, in Balat, Üsküdar and Bosphorus villages. During the construction of the Yeni Camii in Eminönü, the Jews living here were moved to Balat and Hasköy. The Jewish elements can still be seen in these districts today. Apart from these two districts, the other locations that Jews lived were Galata, Kuzguncuk, Ortaköy and Arnavutköy. [2]



Figure 2. 17th century Istanbul according to Eremya Celebi (Source: Cokuras, I.)

<b>Intramuros and the Golden Horn</b>	
Yedikule	Karamans
Samatya	Ethnic-Greeks, small number of Armenians
Between Yenikapı and Kumkapı	Armenians and Ethnic-Greeks
Kumkapı	Ethnic-Greeks and Armenians
Kasımpaşa	Jews
Cibali	Jews and Ethnic-Greeks
Ayakapı	Ethnic-Greeks
Unkapanı-Cibali	Ethnic-Greeks
Fener	Ethnic-Greeks
Balat	Jews on the coast, mixed groups within the walls
Ayvansaray	Jews, part of it is transformed into a Turkish quarter
Around Tekfur Palace	Jews
Edirnekapı	Turkish pavilions and gardens, cemeteries of Armenians and Ethnic-Greeks
Topkapı	Armenians and Greek Gypsies
Silivrikapı	Muslims and Armenians
Yedikule	Cemeteries of Karamans
Eyüp	Muslims and Armenians
Hasköy	Ethnic-Greeks, Jews and small number of Armenians
Mumhane-Kireçkapı	Jews on the coast, Ethnic-Greeks within the walls
<b>European Coast of the Bosphorus</b>	
Tophane	Turkish
Şişhane	Jews
Beşiktaş	Mostly Jews; Armenians, Ethnic-Greeks and Turkish
Ortaköy	Jews and small groups of Armenians and Turkish
Kuruçeşme	Armenians, Ethnic-Greeks and Jews
Arnavutköy	Wealthy Ethnic-Greeks
Bebek	Turkish
Rumeli Fortress	Turkish pavilions
Yeniköy-İstinye	Ethnic-Greeks, Turkish and small number of Armenians
Tarabya	Ethnic-Greeks
Büyükdere	Ethnic-Greeks
<b>Asian Coast of the Bosphorus</b>	
Kanlıca	Turkish
Anadolu Fortress	Turkish
Kandilli	Turkish
Çengelköy	Ethnic-Greeks and small number of Jews
İstovroz	Turkish

Kuzguncuk	Jews and small groups of Ethnic-Greeks
Upper regions of Üsküdar	Ethnic-Greeks and Armenians
Yenimahalle	Turkish and Armenians
Yenimahalle-Çamlıca	mostly Armenian vineyards
Şemsipaşa coast	Jews
Kadıköy	Turkish and Ethnic-Greeks
Princess Islands	Ethnic-Greeks

Table 1. The ethnic and religious distribution of Istanbul's quarters in the 17th century [9]

The ethnic and religious distribution of Istanbul's quarters in the 17th century can be read through the notes Eremya Celebi took during his visit to Istanbul. The residents of 17th century Istanbul is stated in his notes can be seen in Table 1 (Figure 2).

Towards the end of the 17th century, the distribution of the population started to balance. One of the most important reasons is that the city began to develop out of the center. The commercial area has enlarged from Beyazıt towards Aksaray and Fatih and due to the great fires that took place in the 17th century, settlements out of the city walls started to increase in number. [2] While the Bosphorus villages urbanized, the city center's perimeter started to expand. As some districts like Eminönü and Tophane turned into Turkish districts, the non-Muslims in Galata-Pera began to be pushed into the center [10].

Another important development in the 17th century was the emergence of a group in Fener who had gone through an academic education and was aware of the system of thought forming in Europe, and not a part of the clergy [11]. Being an important harbor where merchants from Venice, Geneva and other European countries meet merchants from Asia, an embassy of Venice used to be present here until 16th century [12]. Fener gained importance when the patriarchate was moved here. The Embassy of Jerusalem and Sina Monastery had opened afterwards [13]. The aristocrat Ethnic-Greeks started to construct elaborate mensions around the Patriarchate. The Fenarion Ehtnic-Greeks were installed into the Ottoman administrative system as interpreters, were enriched by commerce and assumed important missions like ambassadorship [14]. They had been key figures in Ottoman State's relations with Europe. Some of the families living here, served as the governor of Wallachia and Moldova Principalities [15]. These Fenarion Ethnic-Greeks who had worked as officers at various degrees in the Ottoman State, had become important actors of the construction of the Greek Nationality as well as being pioneers of Ottoman modernization.

Besides these developments, the improvements in the public sphere in the 18th century caused wider areas of the city to be used and accelerated the construction works in the peripheries. The city started to disperse to the coastal areas. However unfortunately there is not much information on the condition of the non-Muslims during that period.

İncicyan [16] reports that in 18th century Armenians lived at six major spots that had temporal continuity from the Mehmed II's period: Karagümrük, Malta Bazaar (Fatih), Çarşamba, Küçükmustafapaşa, Tavukpazarı and the inner regions of Ahırkapı. Besides, it is also stated that Armenians lived in Tophane as well. Incicyan remarks that the districts with high Armenian population were Kumkapı, Yenikapı, Langa and Samatya. It is also known that there were Armenian cemeteries in Silivrikapı and Davutpaşa and there was a cemetery belonging to Balat Armenian in Edirnekapı. An Armenian hospital, which had a waqf belonging to Bayezid II, was built in Narlıkapı in 1751 [16].

During the same period, wealthy Ethnic-Greeks and metropolitans lived in Fener while Balat was a Jewish district. Palaces of voivodes of Wallachia and Moldova, who were selected from the Fenarions, were located at the same region. Ethnic-Greek cemeteries were present next to the Balıklı Holy Springs and around the Tekfur Palace. It is informed that a Jewish cemetery



was located next to the Armenian cemetery in Edirnekapı, but in 18th century Jewish were burried in Kuzguncuk instead. The name Karaköy comes from the Karai Jews that lived here and other Jewish quarters located in the peripheries were Hasköy (the district that Jews were forced to move from Eminönü) and Ortaköy. Apart from these, it is also reported that the Jews had officers called cemaatbaşı (head of the community) who were in charge of catching the criminals of the community, and they had charity funds for their artisans, patients, poor and others in need [16]. According to Incicyan's text that describes Istanbul's quarters in the 18th century, the general distribution of religious communities regarding the quarters is as it is stated in Table 2 (Figure 3).

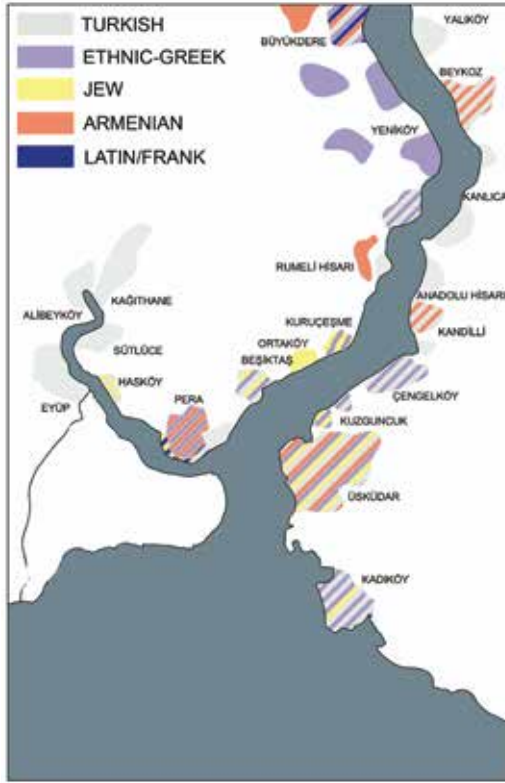


Figure 3. 18th century Istanbul according to Incicyan and Carbognano (Source: Cokuras, I.)

Historic Peninsula	
Eyüp	Small number of Armenians were present in the district where nearly all of the residents were Turkish. The Surp Egia Church that was located here was removed in ١٧٦٦ and Surp Asvuadzadzin Church was partially demolished.
Alibeyköy	Turkish village
Kağıthane	The period's most important public space, the Kağıthane Promenade was located in this Turkish village.
Sötlüce	Turkish village
Hasköy	In this district where Turkish and Jews lived, a Greek Orthodox Church and cemetery were present.
Galata	The Ethnic-Greeks and Armenians made up most of the population here. In the Perşembepazarı region Europeans resided and small groups of Turkish and Jews lived in the district.

<b>European Coast</b>	
Tophane	It is a Turkish district where Topçu Military Barracks and Tophane-i Amire (armory) was located.
Beşiktaş	Turkish, Ethnic-Greeks and Jews lived in the district.
Rumelihisarı	Turkish was dense in population outside the fortress. Armenians lived beyond the hill.
İstinye	Turkish, Ethnic-Greeks and small groups of Armenians lived in the village.
Yeniköy	Mostly Ethnic-Greeks and a small number of Armenians lived in the village. Tarabya: It was essentially an Ethnic-Greek village, but there were some Turkish and Armenians residing here.
Büyükdere	Turkish, Ethnic-Greeks, Franks and Armenians
Sarıyer	Inhabited by Armenians who had converted to Islam.
Yenimahalle	Ethnic-Greek village.
Bahçeköy	Ethnic-Greek village.
Belgrad	Ethnic-Greek village.
<b>Anatolian Coast</b>	
Anadolu Kavağı	Turkish village
Yalıköy	Turkish village
Beykoz	Turkish and Armenians lived here.
İncirliköy	Turkish village
Çubuklu	A garden of the sultan was located here.
Kanlıca	Turkish village
Anadoluhisarı	Turkish village
Göksu	A garden and a palace of the sultan were located here.
Kandilli	A small number of Ethnic-Greeks resided in the village where Turkish and Armenians lived dominantly.
Vanıköy	Turkish village
Kuleli	The garden of Suleyman the Magnificent was located here.
Çengelköy	Turkish and Ethnic-Greeks lived in the village.
Beylerbeyi	Beylerbeyi garden was located here.
İstavroz	Turkish and Ethnic-Greeks lived in the village.
Kuzguncuk	Ethnic-Greeks, Jews and a small number of Armenians lived in the village. Wealthy Jews resided in the coast and a great Jewish cemetery was present.
Üsküdar	It was a crowded district with Turkish, Armenians, Ethnic-Greeks and Jews living here.

Table 2. Istanbul's quarters in the 18th century according to Incicyan [16]

Kadıköy	Turkish, Ethnic-Greeks and a small group of Armenians lived here.
Ortaköy	Jewish village
Kuruçeşme	Ethnic-Greek aristocrats, Jews and a small number of Muslims lived here.
Arnavutköy	Ethnic-Greek aristocrats lived here.
Bebek	Muslims, Christians and Jews
Baltalimanı	Muslims and small groups of Christians
Kefeliköy	Muslims and Christians
Büyükdere	Several summer residences of Christian ambassadors were present in the district.

Table 3. Carbognano's observations in 1794 [17]

With the observations of Carbognano [17] in 1794 (Table 3) are added to this, it is seen that the industrialization process of the Golden Horn had pushed the non-Muslims living in the Golden Horn coast to the Bosphorus villages. Particularly, the Ethnic-Greek aristocrats mentioned by Carbognano are the Fenarion Ethnic-Greeks.

According to Cerasi [1], the Ottoman city that arouses in minds with its monuments and dwellings spread out horizontally, irregular streets, cemeteries and gardens is the 18th century Istanbul. An orientation towards the nature appears during the 18th century and this situation is expressed in the urban space with gardens and promenades. The promenades were important public places of this period when the publicization had begun. They were autonomous spaces that were different from the precedent public spaces which were a part of religious or commercial space. Thus, these new forms of spaces were places where each aspect of the community, regardless of the social class and ethno-religious group, would meet each other. According to Hamadeh [18] the 18th century Istanbul was a product of a mobile community that gave way to the interaction of the culture of the palace and aristocracy with that of the society.

Apart from these, experimentations with new architectural forms had started and the non-Muslim architects began to construct significant buildings apart from their own communities'. Nur-u Osmaniye, a Baroque religious complex composed of a mosque, a madrasa and a library, the last great complex of the Ottoman State, was constructed by Simyon Kalfa who was most probably an Ethnic-Greek. This is a proof of the status of the non-Muslim architects at the time [1].

Located out of the walls of Galata that had always displayed a diverse character, Pera had gone through important changes in the 18th century. French, English, Venetian, Dutch and Genoese ambassadors and wealthy non-Muslims started to establish their own gardens and pavilions in the district which used to house vineyards. The emergence of an Ethnic-Greek quarter in Tatavla –today's Kurtuluş- and new Armenian quarters in Taksim accelerated the development of the district. This mixed European and non-Muslim community constructed their own institutions like French and Armenian Hospitals, in Pera and became pioneers of the urban transformation that reached its peak in the 19th century [19].

#### 4. Period of Novelties: 19th Century

Most of the people departed from the lands the Ottoman State lost in the Balkans settled in Istanbul. Particularly between 1840 and 1900 the number of people that moved to Istanbul was around 100 thousand, including many Europeans. The distribution of the population during the 19th century was as follows: 44.06% Muslims, 17.48% Orthodox Ethnic-Greeks, 17.12% Armenians, 14.74% Foreigners, 5.08% Jews, 1.17% Catholic, 0.50% Bulgarian, 0.12% Latin and

0.09% Protestants. The foreigners' population made up 47% in Galata and Pera whereas it was 10% in the coastal area between Beşiktaş and Rumelihisarı [19]. The population growth and transformation of the Golden Horn into a center of industry increased the number of settlements on the Bosphorus [2]. An extensive amount of construction of summer houses started due to the new space concepts of the time [2] and the emergence of a bourgeois middle class [7]. These constructions were particularly in Kızıltoprak, Kalamış, Feneryolu and Erenköy [2]. The villa settlements on the Bosphorus and the Princess Islands started to expand especially after the Rescript of Gülhane (Tanzimat Firman) (1839) and these places became luxury residential areas used as summer houses by Ethnic-Greeks and Jews. Different from Pera and Fener, on these locations a wide range of building catalogue with nearly all of the Eclectic styles could be seen [20]. Some districts like Pera, Büyükdere, the Princess Islands and Moda adopted the European culture [2]. These were districts that the non-Muslims had resided in a temporal continuity. The period's symbolic buildings, the embassies, were also built in Yeniköy and Büyükdere which were Ethnic-Greek villages. With the existence of these embassies, hotels and pensions started to appear in the district, thus the first tourism concept aroused here [2]. The embassies which were settled in Pera starting from the 16th century, constructed their recent buildings in the 19th century [21]. With the presence of these embassies, Pera had developed as an extension of Galata. By the mid 19th century it became the center for the Italian, Maltese, Catholic and Ethnic-Greek, Armenian and the European. With its embassies, churches and synagogues Galata-Pera district started to house a bourgeois class composed of Levantines and non-Muslims [15].

During the reign of Mahmud II (1808-1839), which can be recalled as a period of novelties, the social reforms had found their reflections in the urban space. As a result of the developments in the diplomatic relations, the visits of Ottoman diplomats to Europe became more often, a lot of travel accounts were written and new urban and architectural approaches were appreciated. The development of bureaucracy brought along new types of state buildings and due to the reforms in the army new monumental military barracks appeared in the city. The international style of the period, Neo-classism was used particularly in the state buildings of the 19th century. Due to the change in the conditions, the proprietary capital accumulation had augmented and thus private constructions were increased both in quantity and quality [22]. With the Rescript of Gülhane secularization, a centralist state bureaucracy and a judicial system other than the Sheria begun to be set [23] and civil rights were vested for every citizen [20]. By means of the process that began with the 1838 English-Turkish Trade Pact, the Ottoman State became a resource for raw materials and an open bazaar. By this way a new Muslim elite class emerged due to the new administrative reforms and a non-Muslim commercial bourgeoisie was born [23]. The biggest income of all these novelties for the non-Muslims and the city was the right for everyone to buy and sell estates. On the other hand, having close relations with Europe, the non-Muslims had become the transmitters of the novelties of the period and became effective in planning of social and communal institutions on education and service. The urban effect of the reforms was to transform Istanbul from an Ottoman-Islamic city to a more cosmopolite city that was designed with methods adapted from the Western models. [20] Various city plans were done in the 19th century. The first one was prepared by Helmuth Von Moltke in 1839. Later F. Arnodin and Joseph Antoine Bouvard prepared two separate plans. These plans, composed of monumental squares and state buildings and radical arrangements, were never executed [19].

Another important feature of the 19th century Istanbul was the non-Muslim and foreigner architects becoming distinguished. The most celebrated ones of these non-Muslim architects were from the Balyan Family who had been the imperial architects. They were active for five generations in 18th and 19th century designing and building various buildings including royal residences, religious and public buildings, and industrial facilities. Educated in Europe, they introduced Western architectural elements and techniques to traditional Ottoman construction. The most celebrated monument built by the Balyan Family is the 19th century Dolmabahçe



Palace. Other residential buildings constructed by the family include Yıldız, Çırağan, Aynalıkavak and Adile Sultan Palace, İhlamur and Küçüksu Pavillion and Malta Kiosk. They had also built mosques, churches and mausoleums: Tophane Nusretiye, Ortaköy, Dolmabahçe Bezm-i Alem Valide Sultan and Aksaray Valide Mosques are the most significant religious buildings in Istanbul that represent the Western influence on the Ottoman mosques.

The first building that carried the identities peculiar to the Tanzimat period, thus being the pioneer, was the Russian Embassy (Figure 4). The building's construction began in 1838 and its architect was Gaspare Fossati. For its construction, materials and craftsmen were brought from Italy. During this period, the first hospital –Bab-ı Seraskerat, the first military barracks, jails and modern schools were built. Administrative buildings in the Historic Peninsula like Darülfünun (university) and Hazine-i Evrak (treasury), palaces and pavilions on the Bosphorus and embassies and private buildings in Beyoğlu made up the significant buildings of the building catalogue of the period. Dolmabahçe and other palaces that are still the most important buildings of the Bosphorus were designed by the Balyans and the first masonry palace, Mustafa Reşit Paşa Palace was designed by Fossati [22]. By the virtue of external trade and expansion in foreign capital, various banks, insurance companies and commercial firms were established in Istanbul and chose Galata as the location, since it had always been the commercial center in close relation with Europe. The city's center of prestige was switched from the Historic Peninsula to Galata [23]. This caused many foreigners and Levantines to settle in Beyoğlu. As a result of this, many embassies and buildings reflecting the European culture and commissioned by foreigners and Levantines aroused. The English Embassy constructed during the first years of the reforms by



Figure 4. Russian Embassy, Fossati, 1838 (Source: Cokugras, I.)

Sir Charles Barry; Embassy of Netherlands and Naum Theater by Fossati; Beyoğlu Town Hall by Barborini; Palazzo Corpi, Italian Hospital by Stampa and buildings that Camondo ordered Stampa and Tedeschi to design are significant examples [22].

This period did not only bring along different building types, but new styles were introduced as well. Military and state buildings were generally designed in Neo-classical style whereas the city exhibited a wide range of styles with the use of Baroque, Gothic, Orientalist and Art Nouveau elements. Besides, with the foreign architects, the number of architects active in the city had increased. After Fossati, other European architects like Mongeri, Semprini, D'Aronco and Vallury produced many important buildings. Apart from that, as a continuation of this Eclectic trend, Turkish architects like Vedad Tek and Kemaleddin Bey developed a style that can be called as Ottoman Eclectic.

In the 19th century, novelties in civilian architecture were introduced as well as in monumental architecture. Even if the same terminology was used, the waterside mansions (yalı), pavilions and mansions were dissimilar both in plan schemes and in façade orders. The adoption of a cosmopolite life style and an eclectic aesthetic approach reflected on the residential architecture.

Developments in urban planning, transport and infrastructure systems, changes in the estate laws, insurances and population growth had brought along new housing types. In the districts that were newly forming or severely damaged by the fires like Kumkapı, Fener and Kadıköy, row houses were started to be built on narrow lots in masonry (Figures 5). When the plan schemes of these buildings are examined it is seen that the multi-functional spaces left their place to spaces



Figure 5. Row houses in Fener (Source:unknown)

with functions clearly defined. Despite all these novelties the traditional façade elements like cantilevers were preserved. All these synthesis reflect the socio-cultural structure of the period [21].

According to Colonas [20], although there were many cultures coexisting, Galata was essentially an Ethnic-Greek district. The developments of the Ethnic-Greek community were triggered by the members of the community who were known as Galata Bankers. When Beyoğlu and Galata are examined today, it can be seen that most of the monumental buildings are churches, schools, and hospitals, cultural and communal institutions commissioned by the Ethnic-Greeks. The common characteristics of these buildings are that they were built by Ethnic-Greek architects and commissioners, and in Neo-classical style for unity. Hagia Triada Church (1880) and Hagios Konstantinos Church for religious buildings; Zagrheion (1890), Loakimelon (1884), Zappelon (1885), Galata School and Marasleion (1901) (Figure 6) for educational buildings; Patriarchate Eugenideion Building and Balıklı Greek Hospital (1903-11) can be given as examples for these buildings [20]. Besides these communal buildings, as Galata became wealthier Pera became a place of prestigious residences. In Pera district, three types of residences were seen at the period: mansions of the wealthy families, bourgeois apartment buildings and single-family houses [23]. In the last quarter of the 19th century, the main arteries of Pera, Taksim and Pangaltı were connected through large and luxury apartment buildings. These buildings reflected the lifestyle of the European bourgeoisie and the new construction techniques. As examples of these Hatzopoulou Passage, Grand Hotel de Londres, Petraki Han, Oriental Han, Hotel Bristol and Cite de Roumelie can be given. On the sign boards located at the front façade of the existing buildings



Figure 6. Marasleion, an example of 19th c. Ethnic-Greek architecture (Source: Cokuras, I.)

in Beyoğlu and Galata, almost 25 Ethnic-Greek architects' name can be seen. According to the *Annuaire Oriental*, over 200 Ethnic-Greek architects were practicing their profession in Istanbul between the years 1880 and 1930 [20].

The Tanzimat period brought many novelties in local administration and citizens' will. In 1855, the first Şehremaneti (municipality) was established and the city council started to function as the decision making body. In this council every community had a deputy and the members were approved by the sultan. However this body was abolished after a year [24]. In 1885 City Organization Commission was established and this commission divided the city into 14 districts in order to distribute the local administrative power. The 6th District, the one containing Pera, Galata and Tophane, was chosen as the pilot district. The main factor in its election was that the district was very popular after 1840s and a European population was concentrated in here. 47% of the population living here were foreigners, 32% was non-Muslims and 21% were Turkish [20]. So the first municipality was established in Beyoğlu-Galata in 1857 (Figure 7). Because there were many foreigners and non-Muslims in close relations with Europe and were aware of operations of municipalities, the procedures were done in French and Ottoman. The municipal council was composed of seven members and four consultants. All of the consultants were foreigners. The necessary conditions in order to become a member were to be a resident in Istanbul for at least ten years and to own an estate in the district that worthed at least 100 thousand kuruş. In this council there had been nearly no Turkish. In the following years, until 1868, municipalities in the Princess Islands, Tarabya and Yeniköy were established. It is remarkable that these were districts with high non-Muslim population as well [24].



Figure 7. 6th District Municipal Building, first municipality established, 19th c.

(Source: *Beyoğlu Magazine* 2007)

The operations of the 6th District Municipality included the demolishing of the walls around Galata, construction of new roads and paving of the present streets. The Ottoman Bank, which is one of the biggest banks and a French-English partnership, had initiated the first horse driven tram on Voyvoda (Bankalar) Street. Other banks contributed in the development of the district and wealthy non-Muslims like Camondo's<sup>5</sup> played a major role in the improvement of Galata. In 1874 the first subway of the city, the Tünel connected Galata to Beyoğlu [21]. By this way the non-Muslims and the foreigners that settled in the city, became a driving force of the modernization of Istanbul both financially and intellectually. For example, the publishers and printers of the period were generally non-Muslims and the actors were usually Armenians [11]. On the other hand, the spectacular balls given in great buildings like the Pera Palas Hotel [25]. reflects the European culture adopted in Beyoğlu of the time. It is known that the sultan had followed these balls and theaters in the second half of the 19th century [15].

Towards the end of the 19th century, the city was divided into regions naturally: Karaköy was a business district, the coastal area between Karaköy and Kabataş was a commercial area, Dolmabahçe-Beşiktaş line was a palatial zone, Beyoğlu was a center of culture, shopping and entertainment, Taksim and Maçka were locations of the military barracks[19]. Although

5 For more information on the family: Le Tarnec, S. and Şeni, N., 2005. Camondolar: Bir Hanedanın Çöküşü, İletişim Yayınları, İstanbul.

partially changed, these divisions are still valid. Karaköy –that was formerly a part of Galata– is still a trade center with prestigious banks. Beyoğlu preserves its character of a culture and entertainment center. Some of the military barracks in Taksim-Maçka axis are demolished and some are converted to university buildings. Although Istanbul's districts' functional characters did not change much, having lost most of its non-Muslim population who had played an important role in her development, Istanbul have gone through a major transformation. After the establishment of The Law of Wealth Tax<sup>6</sup> in 1942 and violence actions towards the non-Muslims in 6 and 7 September, 1955<sup>7</sup>; the non-Muslims had left the city in masses. The districts and buildings they lived in for centuries were left empty or became locations where immigrants from Anatolia started to settle. These districts are mostly corruption areas today and some are the main spots for urban rehabilitation of Istanbul.

## 5. Concluding Remarks

Istanbul has always been in a cycle of destruction and reconstruction due to the earthquakes and fires it faced. When the facts that the borders of the land owned were not determined clearly and public space did not exist in the Ottoman State are kept in mind, it is explicit why the street patterns and land lot sizes changed after each disaster. In short, the constant parameters of the urban pattern were not parcelization or street networks, but religious, ethnic and social structure [21]. Through different narratives of different centuries, it is seen that the non-Muslim settlements concentrated in certain locations. With the rights given to these communities in 19th century, these locations became places for their self-expressions. The Ethnic-Greeks, who were always the largest non-Muslim population of Istanbul, were living in large communities in various districts whereas the Armenians had dispersed settlements. Especially with the Sefarad Jews coming from Spain in 1492 and other Jews from Europe the Jewish population in Istanbul had increased [15] and they lived in number of districts.

The non-Muslims had played an important role in the urban development of Istanbul beginning from the conquest. When Mehmed II brought various groups to Istanbul, he did not only aim to increase the population, but to form a city with qualified citizens as well. On the other hand, not only he was reconstructing a city, but also he was establishing an empire. Hence people educated in the field of beurocracy were needed. Due to this reason, the Byzantine aristocrats were encouraged to stay and play active roles in the government. This aristocrat class preserved its existence in a temporal continuity and became pioneer of transformations in the social system starting from the 17th century.

After the 17th century, the classes and religious communities (millet) in the traditional Ottoman social system started to dissolve. These classes and communities were reconstructed as social classes and nations by the leadership of financial, cultural and political elites. The most remarkable community is the Ethnic-Greeks that established an early middle-class in Istanbul. The main reason for this was their cultural history, their locations in the city and economic opportunities [7].

The income through trade and the construction of schools by the end of the 18th century played a major role in the nationalization process of the non-Muslims. Apart from these schools, which were the center of construction of a national identity, intellectuals who were collecting information on their roots were added to this developing Christian middle-class. This class of Ethnic-Greeks and Armenians started to take place in administration and joined the Muslim

6 For more information: Aktar, A (2010) Varlık Vergisi ve 'Türkleştirme' Politikaları (Wealth Tax and 'Turkification' Policies), İstanbul: İletişim Yayınları.

7 For more information: Güven, D., Cumhuriyet Dönemi Azınlık Politikaları ve Stratejileri Bağlamında 6-7 Eylül Olayları (6-7 September Riots in the Context of Minority Policies and Strategies in the Republican Period), İstanbul: İletişim Yayınları, 2010.



elite that were in charge [7]. Most of the leaders of the national movements in 19th century came out of this class.

Although the concern of self-expression brought along with the construction of a nationality was first experienced by the Ethnic-Greeks in Istanbul, nearly all of the communities had gone through a similar production. The non-Muslims who had existed in Istanbul with various rights and limitations starting from the beginning of the Ottoman reign in the city, had contributed to the urban fabric in every period. Even today the Ethnic-Greek identity in Fener, Jewish identity in Balat-Hasköy region, Armenian identity in Kumkapı-Samatya area can be recognized. However it should not be forgotten that as the non-Muslims were a part of the Ottoman administrative and juridical whole, their districts were a part of the Ottoman Istanbul as well. The silhouette of the Ottoman Istanbul with many minarets had never changed, but especially after the Gülhane Recipt the non-Muslims emphasized their existence in some regions. The main reason for this was that the non-Muslims were set free to buy and sell lands and construct without physical limitations. On the other side, the autonomous character of Galata from the beginning and the identity it gained in the 19th century reveal that the districts of Istanbul did not develop simultaneously and some districts were even pioneers of transformation. It is interesting that these districts were mostly the locations where the non-Muslims lived. Just like the first municipality was established in one of these districts, many modern urban elements had emerged in these regions and spread to other parts of Istanbul from there.

When thinking about the role of non-Muslims in urban development of Istanbul, the religious buildings and dwellings should not be considered alone, but their effects in urban planning and social life should be paid special attention. The condition of non-Muslims in Istanbul is an area that has not been studied deeply. The area introduces new researches on how these groups, continuously tried to be integrated to the Ottoman system, differentiated so much and even became pioneers of certain developments, and how their construction of national identities affected the urban scenery of Istanbul. It is vital to understand the role of these implicit actors to have a full view on the history of Istanbul.

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# Adaptation of Biomimetics into Architecture

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## Abstract

The paper reviews the field of biomimetics in terms of its integration to architecture. Biomimetics as a field that actively uses natural system and is directly related to the environment and for this reason it is of fundamental importance to the growing environmental concerns. Biomimetics has slower adaptation process in architecture compared to other engineering fields. It has been argued that architecture's evolution and interdisciplinary interaction play a role in that.

Keywords: *biologically-inspired design, bio-engineering, environment-aware*

## 1. Introduction

Over these past few decades, environmentally integrated design has become one of the mainstream issues in architectural design. Production methods and life-cycle of buildings are growing concerns. Apart from the high costs there are moral obligations to the environment. This article is going to present a subject called biomimetics or biomimicry, which is not new but, perhaps underutilized in architecture. In some ways its essential characteristics intersect with the problems architecture faces. The term Biomimetics is made of Bios meaning life and Mimetics which means having a talent for imitation. The Association of German Engineers defines it as "a scientific discipline that systematically deals with the technical execution and implementation of constructions, processes and developmental principles of biological systems" [1]. Method of biomimetics provides an in-depth study and understanding of solutions and strategies within wide scope of organisms that have been evolving through various environmental conditions. Natural systems enhance the usage of local energy while reducing complexity of the processes and lower the amount of energy consuming functions. Berkebile and McLenan state that Biomimicry is often described as a tool to increase the sustainability of human designed products, materials, and the built environment [2]. The aim of this article is to discuss the difficulties of integration process of biomimetics into architectural design.

There are two main concerns to be overviewed. Firstly, architecture has reinvented itself with the industrial revolution and with that, it has entered an era of search for meaning through various analogies. Analogy, meaning proportion in Greek, is a cognitive process of transferring information. The purpose of analogy is to acquaint us with new ideas by linking them to ideas we already understand. For example Le Corbusier used mechanical analogies where in his book “Toward an Architecture” he states “Une maison est une machine-à-habiter” – meaning; a house is a machine for living in [3]. This sort of understanding would fill the void that modern architectural expression required back then, however, it would also undermine certain features of scientific analogies which could be used for transferring information on functional level. In essence, by the time biology is properly introduced to architecture it had been acquiring biology in dysfunctional shapes and forms already. Application of scientific basis through biomimetics would be difficult while biology is instilled only as an amusing architectural form.

Second point is that; for biomimetics to function in any discipline, the characteristics of organisms and systems in nature have to be transferred into other fields through scientific analogies, however, biology does not work with same principles as do other engineering fields. Vincent states that the organization of biology and engineering differ in approach [4]. Organisms in biology develop through a process of evolution and natural selection which means that biology is largely descriptive and creates classifications, whereas engineering is prescriptive and generates rules and regularities which would end up in decision-making. Therefore, method of acquiring knowledge and implementation process in engineering is also a long and ambiguous process.

## 2. Architecture's Transition

It is crucial that modern architecture's transformation is observed along with repercussions following the search for meaning. Architecture had fallen into the dilemma without the real necessity of environmental concerns, and for that, it evolved into an unusual state. For example, pre-modern vernacular architecture can be expected to have been built according to the basic principle of “limitedness”. Hagan points out that “until the advent of modern industrial production, with its vastly increased capacity at seemingly no physical cost to ourselves, the effort of making anything was too great to waste”. Every object was therefore used, reused and adapted until it wore out, and even then, the parts were recycled [5]. Habits and concerns changed rapidly with transition to technology and machinery during industrial age in which communities and cultures altered the means of engaging problems.

Vernacular architecture which is delivered as sustainable by default is concerned with a local problem, local materials and local climate. Modern architecture, on the other hand, with all the mechanical advantages at disposal became one global-international style which could be implemented to all cultures, climates and geographies. This is where architecture truly lost its touch with nature and declared itself as sovereign. This is also when architecture became heavily dependent on external infrastructure like electricity etc. In this turn of events Le Corbusier summarized the approach by stating that; “every nation builds houses for its own climate. At this time of interpenetration of scientific techniques, I propose: one single building for all nations and climates” [6]. Banham argues that the use of this new technology was not so straightforward and the promise of improved environmental quality was “ruthlessly sacrificed for the geometrical machine aesthetic and the honest expression of everything” [7]. Hagan suggests that “mechanical systems became essential in mediating between human being and climate to compensate for the building's inadequacies in structure and orientation” [5].

Presumably as a reaction to industrialization Organic Architecture emerged even before major achievements in biology of mid Twentieth century, therefore, it did not contain real biological input. Steadman explains that the term “organic analogy” involves a metaphorical



comparison of works of art with the phenomena of nature, and is concerned with aesthetic qualities rather than strictly scientific parallels” [8]. Architecture would aim to fulfill conditions of organic unity. Organic display of proportions is an approach to animate a nonliving object. Bruno Zevi in his work called “Towards An Organic Architecture” discussed on architecture organic like the concept of organic in nature, and that sustainable buildings are not intended to simply look organic and visually represent a harmony of nature and human habitation but also they must actually provide a functional harmony by participating in natural processes [9].

### 3. Inspiring Biology

As the field of biology advanced and the phenomena were translated into other sciences an interest grew towards natural systems. Blandino in his book Theories on the nature of life explains how biology changes from mechanistic biology where Cartesian aspect perceives organism as a machine into modern biology [10]. During this ambiguous period Driesch tried to explain that the material systems which we called living organisms were not mechanical systems [11]. On the other hand study of cells and their behavior, along the taxonomic ramification of characteristics, was a crucial step forward supporting ongoing discussions which led to a deeper curiosity among scientists. Perception on biology scaled down from forms to cells. New formations under the microscope such as group of blood cells and microbes changed the opinion towards the organisms.

Nicolas Rashevsky in his book Mathematical Biophysics suggested that biology had to be mathematized in order to become engineered [12]. Biology as a field had to have a common mathematical language with other fields in order to be understandable and shared. While observing some of biological phenomena, D’Arcy (1942) summarized some of the organic behaviors as “growth under stresses” and gave some examples from his observations on mathematics of shells explaining that a spiral was a curve which, starting from a point of origin, continually diminished in curvature as it receded from that point; or, in other words, whose radius of curvature continually increased. According to D’Arcy morphology was studying process of formation. D’Arcy recounted Haeckel’s bio-crystallization theory in radiolarians which later inspired architects such as Buckminster Fuller. Buckminster Fuller wrote about microscopic animal structures called Radiolaria comparing their structure to geodesic and spheroidal manmade structures [13]. He also stated that Radiolaria was not symmetric and it was not as simple as it appeared. Organisms in nature started becoming inspirational on micro levels.

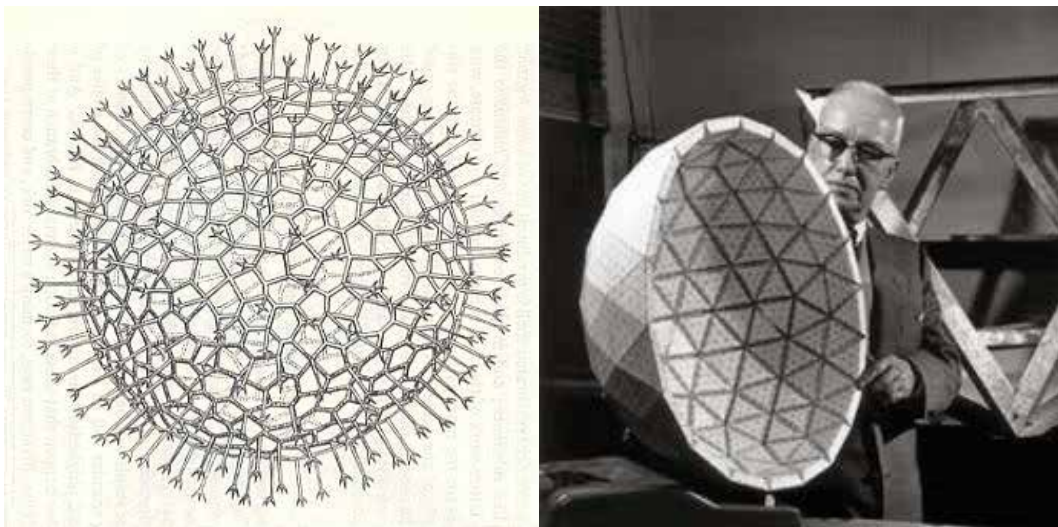


Figure 1. The shell of radiolarian *aulastrum tricerus* (complete shell) was an inspiration for Fuller’s geodesic domes, (Source: [14])

First examples in biomimetics studied general mechanics of animals and plants. One of the first pioneers in this field was Leonardo Da Vinci (1452-1519). Da Vinci's famous experiments on spread wings and their functional analysis studied weight ratio and muscle structure of flying birds. After Da Vinci's attempts Giovanni Alfonso Borelli (1608-1679) studied movement process of various animals. Sir George Cayley (1773-1857) also studied self-stabilizing flight models and parachutes through the example of *Tragopogon Pratensis*. These were attempts to build machines. However, first real contribution in biomimetics is Velcro's Hook and Loop Fastener. It was invented by Swiss electrical engineer George de Mestral in 1948. Design of Velcro was based on hooks of a plant called Burr which was observed under microscope. Hooks could connect with anything that had loop in it [15]. In 1950, neurophysiologist Otto Schmitt officially coined the term Biomimetics. Schmitt Trigger was one of the first examples that simulated nervous system used for elimination of superimposed noise in electric circuits. This invention was an example of simulating signal processing taking place in the nervous system. Biomimetics has been studied in particular by U.S. military engineers such as Lieutenant Jack E. Steele from Wright Patterson Air Force Base in Dayton, Ohio. In 1958 Lieutenant Steele introduced term Bionics into military doctrines [16]. According to Papanek until that point there hasn't been any written documentation in the field of Bionics [17]. Most of the experiments were military purpose and probably inaccessible.

As biomimetics evaluates either a problem or a source that can anticipatorily become useful, researchers tend to provide their own methodologies. In recent years, production and applications have altered the theoretical framework since Juri Lebedew wrote first comprehensive work on *Architekturbionik* in 1960s. Lebedew emphasized that in nature "the principle of integration of function, form and structure is effective, and is adapted to the existence and interrelation with the environment" [18]. Most comprehensive work on biomimetics was published in 1990 by Werner Nachtigall who coined the term "Technical Biology" consisting of ten principles [19].

1.	The concept of biological design can be understood in analogous relation to the concept of technological design
2.	The structural relation of technical biology and bionics is of image and reflection
3.	The organism forms a functional whole
4.	Biological design follows the principle of optimum integration
5.	The organism compensates for harmful overloading
6.	The overall size of an organism defines its stability
7.	An organism has environmental contact with the inorganic
8.	A form always meets multiple requirements
9.	The organism is in contact with other organisms
10.	The organism faces a permanent energy crisis

*Table 1. Werner Nachtigall's principles for technical biology*

#### 4. Information Gathering

The engineering principles of biological systems can be applied to the design of buildings as a process. It requires a commitment to evolutionary development, analysis of the material organization and behavior of individual species. Biological systems are made of weak materials to make strong structures and for that reason they differ to responses and properties of manmade structures. Plants, for example, are hierarchical structures, made of materials with underrated

properties which can be changed by the plant in response to local or global stresses. High variety of parameters and responses exist, therefore, all the researches are dependent on the specific subject of interest.

Organizations such as The Biomimicry Institute intercross multiple disciplines and research various probabilities in nature without any predetermined problem in order to create a taxonomic database. Institute was founded by biologist Janine Benyus in 2006. The Biomimicry Institute has developed functionally indexed database by the name of AskNature accessing scholarly articles relevant to biologically inspired design [20]. Biomimicry Institute, describes working process of six phases following identification, interpretation, discovery, abstract, emulation and evaluation. Open-source database AskNature containing design and engineering functionalities of biological systems also works through these phases. Another similar approach has been proposed by Design Intelligence Laboratory. Methods work as problem-driven and solution-based. Two processes involve definition of biological solution, extraction of the biological principle and application of the biological principle [21]. Problem-driven approach starts with the definition of problem than reframes and searches for biological solutions. After defining biological solution principles are extracted and applied. On the contrary solution-based approach identifies a biological solution, defines biological solution, extracts the biological principle, reframes solution and assumes a solution to a possible problem. Yoseph Bar-Cohen in his work called Biomimetics: Biologically Inspired Technologies, points out that “approaching nature in engineering terms needs to sort biological capabilities along technical categories using a top-down structure or vice versa”. Similar to principles of Design Intelligence Laboratory, Cohen proposes a top down approach which is based on foregoing basic research studies to find possible natural models or concepts which are then used to elaborate a specific technical solution. As an opposite, bottom up approach starts by a definite technical problem and produce solutions from nature for an analogous problem [22].

Biomimetics research has also been conducted within TRIZ “Teorija Reshenija Izobretatel'skih Zadach” meaning Theory of Inventive Problem Solving. TRIZ was founded by Genrikh Altshuller “to produce a theory which defines generalizable patterns in the nature of inventive solutions and the distinguishing characteristics of the problems that these inventions have overcome”. Method starts with definition of the problem and selection of properties and functions. Conflicts and contradictions are revealed and linked with TRIZ matrix where solutions are compared. TRIZ expands concept through categorical division of functions for chosen parameters to systematically solve identified problems. TRIZ method also revealed that technology manipulates energy while biology uses structure and information from the nature [4]. In contrast to establishing a generic database and matrix based function solving, Maibritt Pedersen Zari proposed to categorize biomimetics into three different levels; Organism, Behavior, and Ecosystem. First level refers to mimicking of organisms such as plants, insects and animals. Second level mimics how an organism behaves and third level is the mimicking of whole ecosystems and the common principles. All three categories are divided into five sub categories as form, material, construction, process, function [23].

## 5. Various Examples

According to Weinstock design of natural living systems is not produced by optimization and standardization but by redundancy and differentiation [24]. Biomimetics is a self-organization because it is respondent to an active adaptive process. Cells and tissues undertake a change towards specializing form or function in order to gain performance capacity. Self-organization promotes system's properties and functions under increased order to satisfy its needs. Fundamental element for such system is the energy. As in any system metabolism

encompasses the physical and biochemical processes that occur within a living organism which are necessary for the maintenance of life. The biological purpose of metabolism is the production and storing of usable energy [22]. One such product is Artificial Photosynthesis. Artificial photosynthesis replicates the process of photosynthesis, converting sunlight and carbon dioxide into carbohydrates and oxygen in order to pave the way for self-sufficient and zero-pollution buildings that are independent from centralized energy-grids. Light photosynthesis-capable membranes are a promising direction for further development. Others include the use of living organisms, such as algae and bacteria [19]. In regard to artificial production of natural organisms, funded by the European Commission of 14 European and US universities and businesses, Programmable Artificial Cell Evolution (PACE) is an integrated program which is about development of artificial cells and methods to program their chemical functions for self-assembling purposes. Virtual level of biomimetics includes computer simulations that are critical development tool for testing the behavior of simulated system and modification without the high cost of manufacturing. Such tools are used to investigate the performance of complex systems, and address such parameters as thermal, aerodynamic, mechanics, material behavior, and real-world factors [22]. Also, Finite Element Analysis (FEA) is a well-known technique for the analysis of manufactured engineering structures. Numerical analysis technique is used for obtaining solutions to the differential equations that are used to describe a wide variety of physical problems.

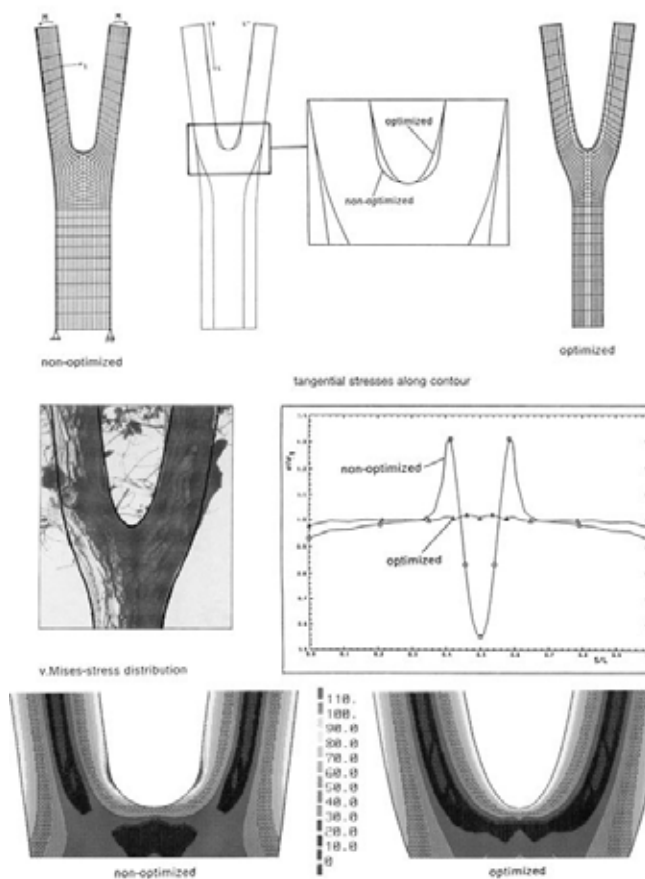


Figure 2. Comparison of stress in an optimized and a non-optimized fork by Mattheck

Software for calculation and reduction and optimization of the structure was proposed by Mattheck in terms of stress relief observed in adaptive growth of trees. A method called Softkill (SKO) suggests reduction of unnecessary structure as much as possible and optimizes topology of constructive parts while minimizing the amount of material. Softkill has been used by automotive manufacturers such as Daimler and Opel [25]. There are several other software programs such as Topostruct in which it uses similar principles for material reductions.



On materials level new composites with increasingly complex internal structures have been developed based on biological models. Strong transparent or translucent films can be produced with a water-repellent and self-cleaning surface for facade systems from mimicking self-organizing behavior and complex functions of natural polymers. There are materials with five times bigger high tensile strength while being lighter than steel such as Kevlar which has been adopted for lightweight cables and ropes in many marine and naval applications. Due to its high impact resistance it is being used in military and civil aircrafts. Kevlar has not been used widely in architectural construction. Kevlar is produced, in part, by manipulation of the liquid-crystalline in polymers. Spiders use the low viscosity in the liquid crystalline regime for the spinning of their silk. There are also industrial and economic techniques for production of foams in metals, ceramics and glass. Foamed cellular materials gain extraordinary properties by cellular solids, analogous properties to those of biological materials while manufactured from inorganic materials [22].

A Los Alamos National Laboratory sponsored project called Protocell Assembly, seek to assemble a minimal self-replicating molecular machine where nano-systems can perform useful tasks. Several universities are also conducting research into membrane materials that incorporate biological molecules capable of selective recognition of a specific signal in such a manner that the membrane will respond by changing its porosity which will enable other molecules to permeate the membrane [22]. This development could contribute to architecture with smart biological membranes that can interact with their environment based on self-assembling biological structures and polymers. There are also drag resistant materials based on shark's skin. The tiny scales covering the skin of fast swimming sharks, known as dermal denticles (skin teeth), are shaped like small riblets and aligned in the direction of fluid flow. Shark skin inspired riblets have been shown to provide a significant drag reduction up to 9.9% [26].

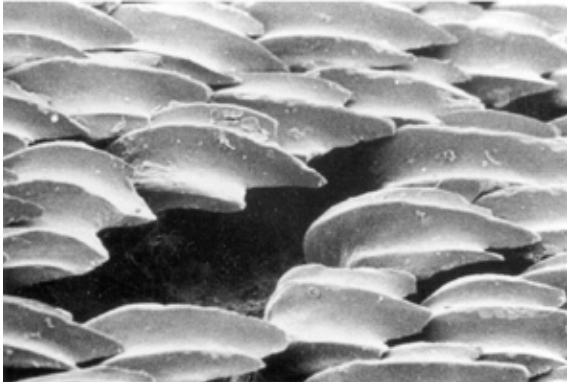


Figure 3. Dermal denticles shaped as riblet on micro scale, (Source: [26])

## 6. Three Phases of Biomimetics for Architects

Architecture is non-living, however it is part of in-animated nature, and is subjected to the same physical principles and processes and for that reason resemblance is as significant as analogous functions. Architecture for a long time has incorporated environment as a basis for support of human life. Formation of something as contradictory as decline of environmental well-being demonstrates how the nature as domain has been neglected as a database of problem solving information and systems. Beings in nature possess patterns of production techniques and system design contrary to those that have been cultivated by human since the industrial revolution and therefore biology should have been observed as a constant formation of adaptations and solutions for the need of survival. Presently, observations and production in smallest scales by computer aided monitoring contributed to a great extent in development of biomimetic field. Observable sources from every scale in the nature diversified the method along the capability of the observer. Under extensive studies, one of the most distinguishing

characteristics of biomimetic mechanism is the ability to operate autonomously in complex environments by being multifunctional in order to adapt to random changes. For Architects, biomimetics could be taken into consideration under three interconnected phases;

1. Structure
2. Process
3. Material

## 7. Structure

In nature, beings structurally encounter various forces such as contortion, buckling, compression and contractive force and manage to stay cool or hot through drastic climatic changes. It is almost impossible to separate structure from body or envelope while naturally occurring shape is based on the forces it is being exposed to. Several studies based on structure were done on architectural projects which had to fulfill the task of load bearing. Structures in this part change in scale from metric to micro and eventually to molecular levels.

One of the most well-known practitioners of natural structures was Frei Otto. In late 1960's, Frei Otto began multidisciplinary studies with Institute for Lightweight Structures in Stuttgart implicating principles of biology into his works. Otto studied Gestaltwerdung meaning emergence of form. For Gestaltwerdung morphological study is the study of structural efficiency which can be stronger but use less material. Selbstbildung or self-forming emphasizes the formation of materials to find their own forms by natural means. He used membranes and tensile structures which resulted remarkably similar to spider nets in working principle [27].

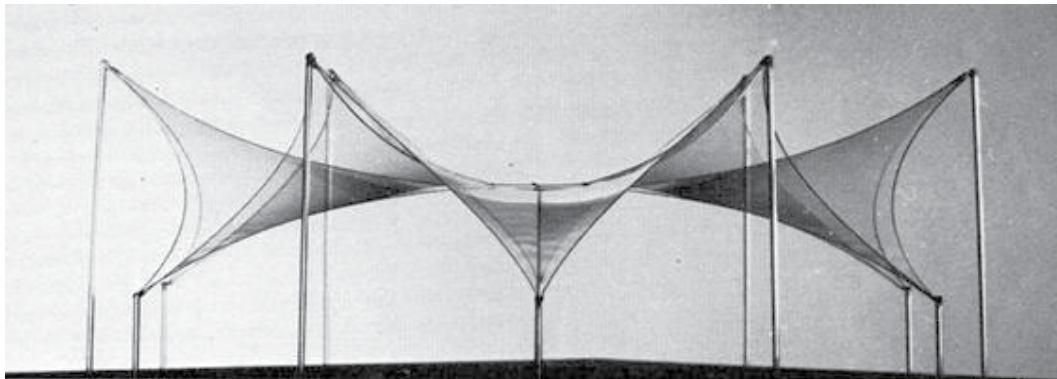


Figure 4. A model of tensile structure by Frei Otto, (Source: [27])

Otto's projects would involve tents with minimal surface areas based on stabilizing inversion of traction lines inside grid shells and pneumatic envelopes whose form is determined by pressure ratios. Simple materials, lightness, flexibility, removable and changeable building method emphasizes inconsistency or an ephemeral approach. However, lightness means less material and less effort to produce it. Method of folding light and strengthening of soft material provides resistance. Otto's concern was on low energy structures made of soap films spreading between fixed points in order to cover minimal area [27].

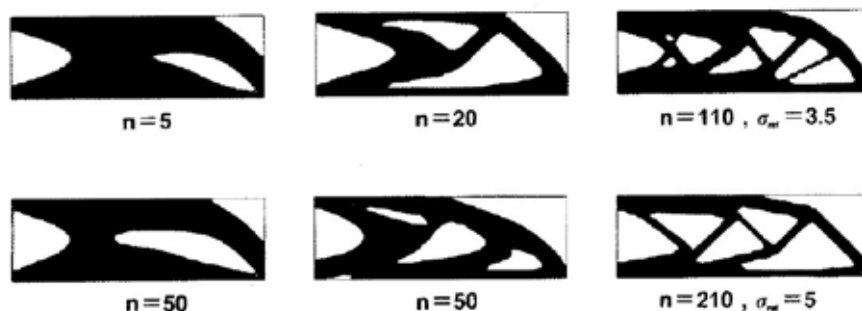


Figure 5. Material reduction by softkill option

Contrary to Otto's approach, in recent events material is studied under the terms of redundancy and lightness by Computer Aided Optimization. Simulations that are made can be tested without the manufacturing of actual objects. Finite element analysis is a numerical analysis technique that is used for obtaining solutions to the differential equations which define physical problems. "Softkill" suggests reduction of unnecessary structure as much as possible and optimizes topology of constructive parts while minimizing the amount of material [25]. One other software called Topostruct uses similar principles for material reductions. Under generative computational process replicating natural processes, it is possible to develop close examples of artificial structures. Simulating growth processes with system-extrinsic and system-intrinsic organizational information has potential in architectural design in terms of structure, process and material.

## 8. Process

Species develop unique set of skills to survive through various conditions. As Nachtigall points out organisms have constant energy crisis and they are in constant motion of either preserving or finding new resources to satisfy this very fundamental necessity. Energy has a differentiating meaning depending on the conditions. Some species live as a group such as Mound Building Termites sharing a common goal and space that maintains air temperature by building extensive system of tunnels and galleries in order to ventilate underground living space while others like Stenocara Beetle live a solitary life in desert seeking moisture from the air flowing through a wind. Both of these examples describe peculiar processes. An example that is very often used in architecture is Eastgate Centre in Harare, Zimbabwe. Mick Pearce, the architect of the project based his design on principles of mound building termites. Pearce described what was requested from the project;

They said that no direct sunlight must fall on the external walls at all and the north facade (direction of summer sun) window-to-wall area must not exceed 25%. They asked for a

balance between artificial and external light to minimize energy consumption and heat gain. They said all windows must be sealed because of noise pollution and unpredictable wind pressures and temperatures, relying on ducted ventilation. Above all, windows must be light filters, controlling glare, noise and security [28].

The Eastgate Centre of Harare design structurally replicated self-regulating mechanism of mounds which provided consistent temperature without the support of air-conditioning or central heating. In order to achieve this constant temperature there are breeze-catchers at the core of the structure which draw in air, then cool it by pulling it through chambers carved out of the wet mud at the base, while hot air escapes through flues at the top of the mound [29]. Energy and expenditure requirements of the centre dropped significantly in comparison to similar sized buildings in the zone.

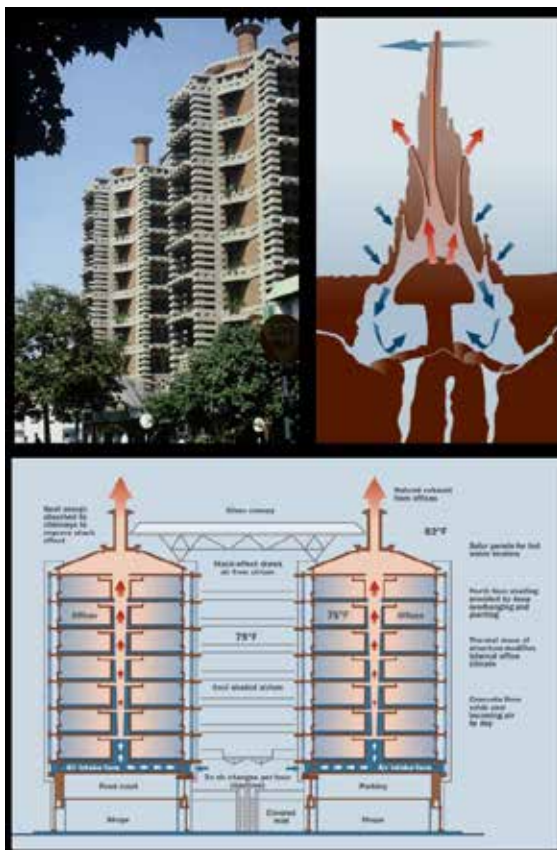


Figure 6. Eastgate Centre, (Source: [30])

Another example on processing of information is based on stand-alone organism. Professor of biology Andrew Parker studied the beetle from Namibian desert called *Stenocara Gracilipes*. Its body surface is covered with dissimilar convexo-concave surfaces including hydrophobic micrometer sized bumps and hydrophobic patches in between that are one-tenth the size of the bumps [16]. *Stenocara* beetle lives in deserts close to seaside. It harvests smaller than usual dewdrops through moisture contained in the air. It is able to capture moisture from the swift moving fog that moves over the desert by tilting its body into the wind. The beetle stands up straight and waits until droplets pile up on its surface.

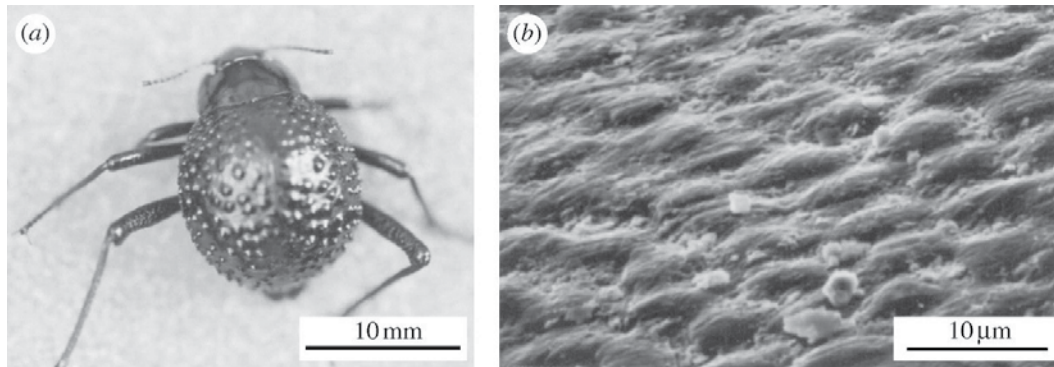


Figure 7. *Stenocara gracilipes* (Namibian beetle) (left) and micrometer sized bumps on its surface (Right), (Source: [31])

Water-gathering material that mimics the skin of *Stenocara* has been developed by researchers from Massachusetts Institute of Technology. Layer-by-Layer method was used in forming of hydrophilic bumps on a solid bottom layer while the area in-between was covered by water-repellent fluoride compounds [16]. On larger scale dew collection method extracted from *Stenocara* Beetle can be used for securing water resources in dry lands. Application from this information was used in Sahara Forest Project. Moisture from seawater trapped by evaporator grills in the air is condensed and used for non-fertile land. Matthew Parkes proposed similar process of biomimetics for an arid region of Namibia with fog-catcher design using special polymer surfaces for the Hydrological Center of the University of Namibia [32].

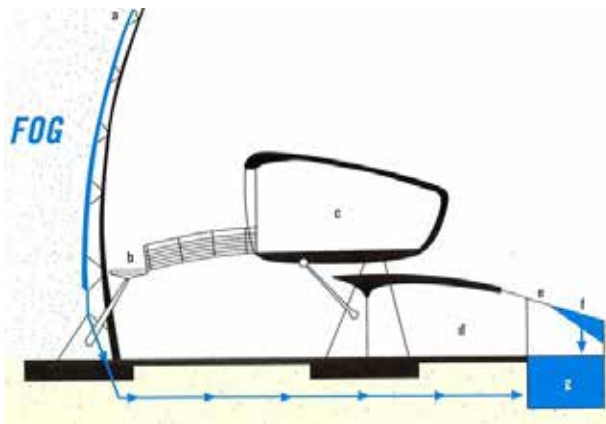


Figure 8. Hydrological Center of the University of Namibia adopted from Matthew Parkes, (Source: [33])

## 9. Materials

Materials produced by the information of biomimetics on micro and nano-scales are exceedingly important from architectural point of view due to features such as resistance and durability while being light and smart. Research and development methods are complex due to their scale. Water repellent surfaces, adhesives surfaces without chemicals, and photonic materials all together contribute substantially to the quality and performance of built environment. Materials are developed mostly as Nanostructures. Biology also comprises of



nanostructures. Recent developments in nano and micro-fabrication, as well as self-assembly techniques, are driving the development of new functional materials and unique coatings that mimic biomaterials [22].

One of the most famous examples was based on lotus leaf. Professor Wilhelm Barthlott [34] from Bonn University examined lotus leaves and discovered that microstructure and secretion of compounds on the surface have a synergetic effect that produces super-hydrophobic, self-cleaning property which has been called “Lotus Effect”. Surface has high adsorption power which can hold water upside down. Wettability of a solid surface by water is governed by material’s hydrophilic and hydrophobic property [16]. Low level of surface free energy vests cleaning effect. Material that can be applied as a paint or coating with these properties is effective against hazardous gases and liquids.

Another example to micro scaled materials are antireflective surfaces which have been discovered several times on insect eyes and leaves of plants in the tropical forests. Manufacturing of such material improves absorption of light. Vukusic explains that in certain animal and plant species, photonic-based colored appearances are very highly evolved while visual appearances of many animal species concurrently comprise optical features that are visible to human vision and those that are covertly concealed beyond human visual sensitivity [35]. Shinomura states that the body color of jewel beetles with characteristic metal luster is called structural color which does not fade because the microstructure is shorter than the wavelength of light [16].



Figure 9. Jewel beetle, (Source: [36])

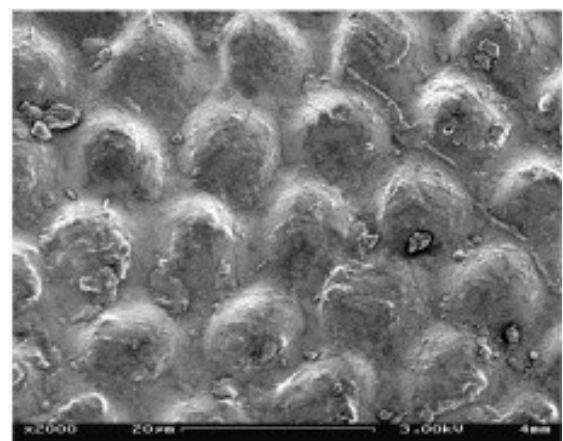
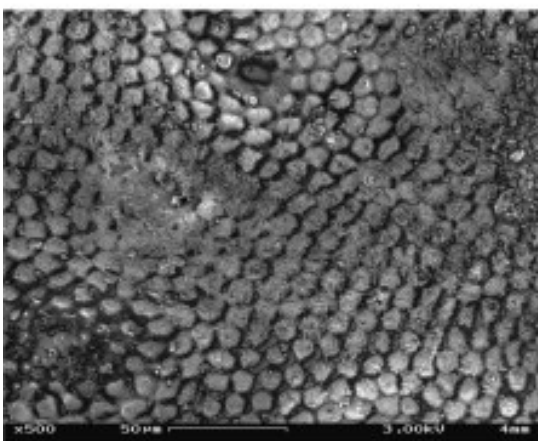


Figure 10. SEM (scanning electron microscope) images of jewel beetle tissue, (Source: [37])

Geckos’ setae is also mimicked in order to acquire adhesion properties in materials. These setae, which are microscopic hairs on the bottom of their feet, use van der Waals forces to run fast on smooth surfaces such as glass [38]. This type of adhesion could provide alternative to chemically enhanced adhesives.

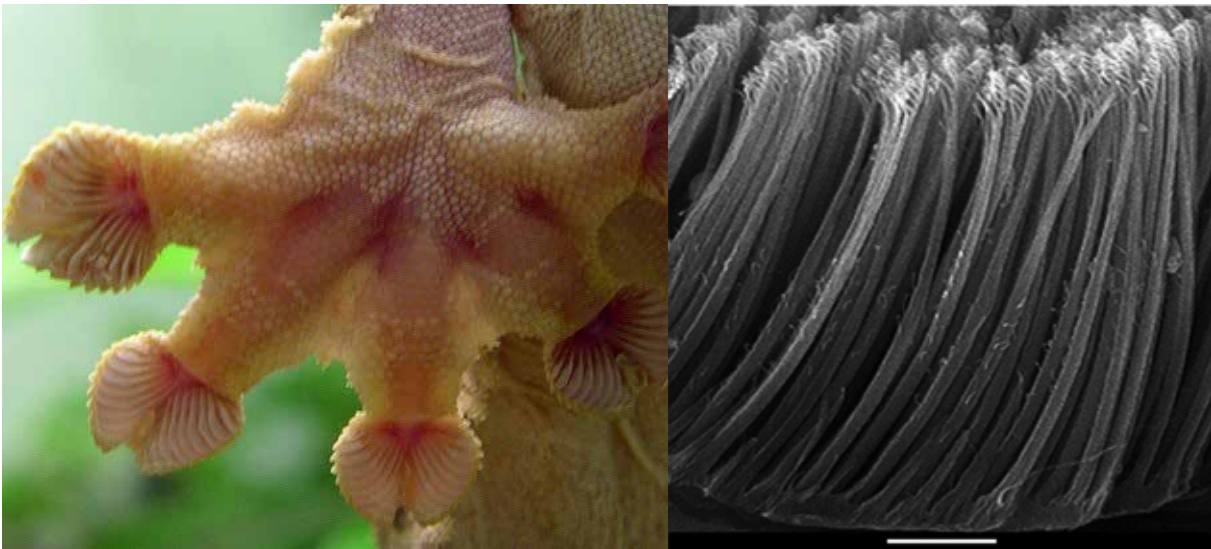


Figure 11. SEM (scanning electron microscope) images of gecko's setae (right) and gecko's foot (Left) , (Source: [39])

Most of the materials are in phase of development such as Shrilk discovered by researchers in Harvard's Wyss Institute for Biologically Inspired Engineering (2012). Inspired by insect's flexible and thin outer shell (cuticle) it is a combination of shrimp shells and protein of silk. It is claimed to be clean and lighter than but as strong as aluminum. Basic ingredients for Shrilk are fibroin and chitosan of which both are biodegradable and biocompatible.

This part conveys an understanding about the mechanics of biomimetics through various approaches and examples. Selection of categories is outlined under three entities that could be used as design parameters. Structure represents a total object responding to physical forces. Chain of events -such as adaptation- can be described as a process where it is constantly in natural cycles. Material level is perhaps the most crucial step because it determines capabilities/properties or skills which are fundamental for adaptation. Characteristics of examples indicate a complex system that is in need of accessible and substantial technical foundation in order to be easily applied into architectural design. Most of the examples constitute common principles. Main points of sources of biomimetics used in examples and approaches demonstrate following general principles:

- Reduction of Weight and Material
- Usage of Simple and Local Resources
- Lowering Energy Demand of Production and Maintenance
- Utilization of Materials on Micro Level
- Multi-purpose Oriented
- Biodegradable

Most importantly the understanding of biomimetic architecture delivers crucial information for the discussion on form finding. Concept of form obtains a new scale because biomimetics as a discipline is predominant in material sciences and, therefore, most of the recent cases are based on micro scales. Even though some examples are not up-to-date all of them outline the basic principles of biomimetics in order to help architecture understand and prevent it from misusing analogies that are employed for the purposes of collecting information. Although examples display that architecture is not on par with other engineering disciplines, information gained through biomimetic approaches can be used as an input in the early phases of architectural design in order to achieve sufficient effect overall and reinstate a level of contact with processes taking place in the environment.

## 10. Conclusion

It is possibly a common mistake that the architect redefines and conceptualizes nature as an abstract idea for it to be a purpose of design. Analogical approaches perhaps misused underdeveloped biological input which caused deviation in conception of biology. In terms of environmentally suitable design biological knowledge of an architect has been limited to imagination and metaphors so that it could become a geometrical application. Now, however, it is certainly a case in which biomimetics should provide depth into architectural thinking. In order to approach nature in terms of engineering from a designer's point of view, it is necessary to sort biological capabilities along technological categorization using a top-down structuring or vice versa. Gaining the most from nature's inventions requires bridging of the gap between the fields of biology and engineering. The field of biomimetics is multidisciplinary requiring the use of expertise such as computational and material sciences, robotics, neuroscience, biomechanics, and many other related fields. As a field in-between it has to be adaptive, however, for it to be a part of architecture, following issues have to be resolved;

1. Lacking standard technical basis in biomimetics for a progressive architectural design due to difficulty of information transfer as a functional analogy.
2. Clarification of historical progress that has established a misleading non-scientific analogical interpretations
3. Research and development studies; expansion from commercial to other fields
4. Complications for architect as a design feature due to its deep and versatile multidisciplinary characteristics addressed in education

Analogical approaches that do not feature scientifically correct biological ingredients have created problems particularly in terms of environmental adaptation. Architectural approaches that are scientific or epistemological will provide new and versatile qualities equal to the number of vast number of already existing systems in nature with the growth of information domain. One of the major issues which faces architecture is crossbreeding of fields from various sciences. As biology coalescences with other fields products are rapidly based on biological preferences due to environmental concerns. Architecture's duty should be to get acquainted with biological input not just on basic level but in detail. There is a vast territory to be explored for architecture in biology that could provide solutions concerning efficiency in every department.

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# Architectural design between heritage and contemporary Arab architecture: Case study of Doha, Qatar

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## Abstract

Present is past for tomorrow what we see now as contemporary, will be heritage tomorrow. In this research an attempt is made to outline the relation between heritage and contemporary Arab architecture of Doha/Qatar in order to understand the future vision of architecture. The relation between heritage and contemporary is a complex issue, especially in the culture. One goal of this research is to investigate the importance of using the local data in respect of nature and culture to learn from the architecture experience to reach a sustainable architecture.

This research illustrated the example of 'Doha/Qatar', the city is affected by fast urban transformations and changing social structures. Hence examined questions how the architecture and culture in Doha/Qatar were affected by this transformation. This study elaborates how we can achieve the sustainability of the architectural heritage in order to evaluate the issue of architectural design for the future vision.

*Keywords: Arab Architectural Heritage, Contemporary Arab Architecture, Gulf Architecture, Sustainable Architecture, Identity, Doha/Qatar.*

## 1. Introduction

The current urban development and contemporary architecture in Doha/Qatar has been explained through several case studies highlighting the needs for designing parameters for the future design taking into account traditional elements that should be incorporated and transmitted to the present time. This issue has been defined by hypothesis that: analyzing inherited architecture and making its components workable in contemporary architecture, it would be possible to produce a contemporary architecture corresponding to our aspiration. In addition, the using of the local data in respect of nature and culture to learn from the architecture experience is very important to reach a sustainable architecture.

Also, this situation is evident in most Arab countries. Particularly the case study of Doha/Qatar, elaborates the rapid changing based on very fast economic development. This economic boom is encouraging increased foreign population of about 80% through migration to local inhabitation and economic activities have changed the way people live. Again the expectations of

city authority to meets the standards of 'FIFA Qatar World Cup 2022' has led to acceleration of architecture in Doha and this has made the city one of the most advanced cities in architecture globally. As most advanced architectural city with dynamic economy and its potential to influence Arab and world architectural design, Doha/Qatar provides the basis for further case studies. Moreover, it should be noted that the aspect of architectural heritage and its preservation has been neglected; and it should be one of the major issues that need to be discussed as well as attempts to deal with it.

This study is aiming to prove that architectural heritage is not contrary to contemporary, but it is a sign of communities' maturity in this age. It warns against the hazard that endangers the future of architecture in those areas and emphasizes the use of inherited methods of architecture in contemporary and future one. Many studies had noticed that contemporary Arab architecture does not meet current needs, and this is used as a base for the hypothesis that inherited traditional architecture and its components can be integrated in contemporary architecture. On the way to produce a more expressive type of contemporary architecture corresponding with our aspiration.

Key components of both inherited and contemporary architecture analyzed in order to prove the hypothesis, aiming to discover the best methods of using inherited architecture designs in our contemporary architecture to achieve a more valuable architecture. In addition, this research is to investigate the importance of using the local data in respect of nature and culture to learn from the architectural experience to reach a sustainable architecture, and to develop a link between the values of traditional architecture, the use of technology and the influence of contemporary design methods. Furthermore, it tries to develop optimal standards for contemporary architecture and housing architecture in Doha city taking into consideration that housing represents more than 90% of all urban structures in any city.

## 2. A comparison between traditional and contemporary architecture in Doha

Those who are concerned with the future of built environment in Doha should firstly refer to their rich relatively architectural heritage, study its forms and elements and understand the essence behind it. Secondly they should analyses the imagery of the contemporary world as expressed by global-modern buildings. This kind of analysis is aiming at explaining the potential continuity of traditional architectural patterns by exemplifying how some of them can be adopted or re-interpreted in a contemporary context [1].

For designing contemporary Doha in the future and according to traditional principles, one must dissociate the essential from the accidental to define what is still relevant and what is to be rejected. In this case, certainly one would wish neither to preserve all old elements in new cities, nor to build new ones that are mere copies of the west. [1] Says, Encouragement of vernacular building types and technologies that have been developed and transferred from one generation to the next also secures the continuity of building traditions.



Figure 1. Doha: from a traditional settlements to a globalized City,  
(Source: <http://www.q-urbarch.org/>, date retrieved 12.11.2013.)

### 3. Urban fabric \ Traditional Town of Doha

The traditional town was compact and emerged from within. Houses, schools, mosques were grouped spontaneously by a process of accretion. Therefore, it was the outcome of many relationships, such as natural and cultural factors. The figure 2. provides information related to Doha city development through its early traditional phase.



Figure 2. Doha city development through its early traditional phase shows the Pre-Oil settlement in 1947, (Source: <http://www.architecturalpapers.ch/index.php?ID=64>>, date retrieved 12.11.2013.)

### 4. Urban fabric \ Contemporary Town of Doha

Most of the current urban developments in Doha is not Arab-Islamic in the traditional sense as described before, but rather of an international contemporary style. This style has ignored the valuable concepts of traditional planning, and emphasized the garden city pattern and western planning ideas. These ideas are based firstly on the use of wide, gridiron street pattern, easily penetrated by moving vehicles. Secondly, by the use of free standing layouts filled with high rise buildings. Figure 3, shows the contemporary urban fabric of Doha.



Figure 3. The contemporary urban fabric of Doha, (Source: <http://onebigphoto.com/downtown-doha-from-airplane/>>, date retrieved 15.10.2013.)

### 5. Traditional streets of Doha

Traditional street was designed mostly for pedestrian and domestic animals. Streets were characterized by both simplicity and unlimited variety. They were full of artistic and aesthetical pleasure at the same time. The street layout is expressed by organic compact planning and narrow winding paths, as we shown in the figure 3. Many dead end streets can be evaluated as the visible result of the Arab's great estimation of the private area. Unlike our modern planning, it is so rare to find any two main roads crossing at right angles, they are often staggered.

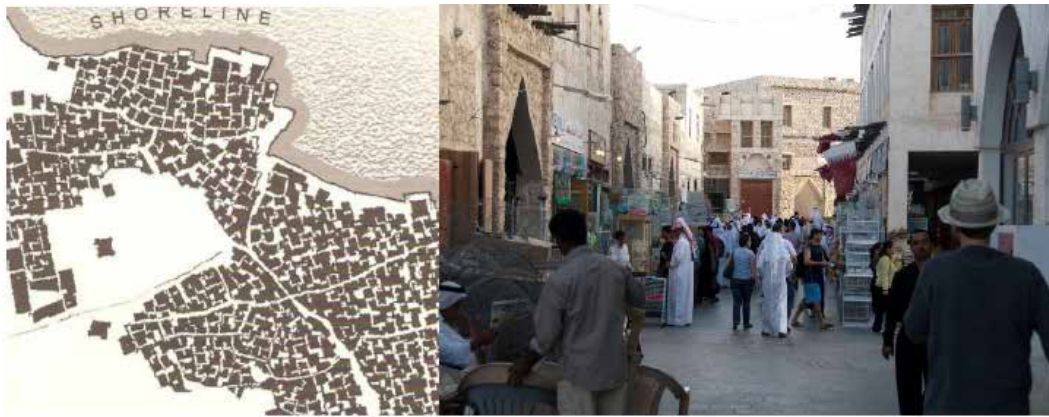


Figure 4. Traditional streets of Souq Waqif during the day; a catalyst for urban diversity, (Source: Salama A. Urban Evolution of the City of Doha: An Investigation into the Impact of Economic, 2010.)

## 6. Contemporary streets of Doha

In contrast to the traditional street, Modern Street looks wide, straight and designed mainly to serve vehicles. Consequently, the horizontal surface of the new city is covered by black asphalt. Such a desert of asphalt and buildings, from the climatic point of view often makes the city of Doha hot.



Figure 5. Contemporary streets of Doha, (Source: <http://catnaps.org/islamic/society.html> >, date retrieved 16.11.2013. )

## 7. Traditional House Design and form in Doha

The traditional Arab Qatari house is not simply the result of physical forces or any single casual factor, but is the consequences of a whole range of socio-cultural factors. Figure 5, shows some of different elements related to traditional Qatari house .The form was modified by climatic conditions and methods of construction, materials available and the technology at the time. By the effect of these factors, the house emerged with its courtyard as the basic unit in the house.

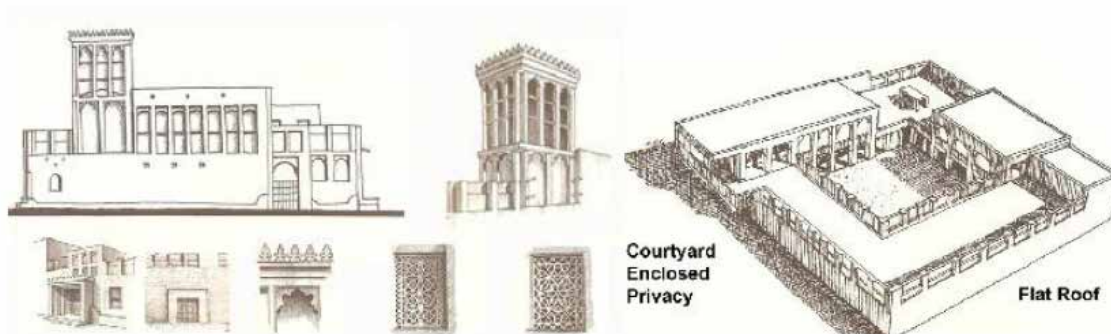


Figure 6. Example of different elements of traditional house, (Source: Qatar University. Language for Contemporary Qatari Architecture, 2010. )



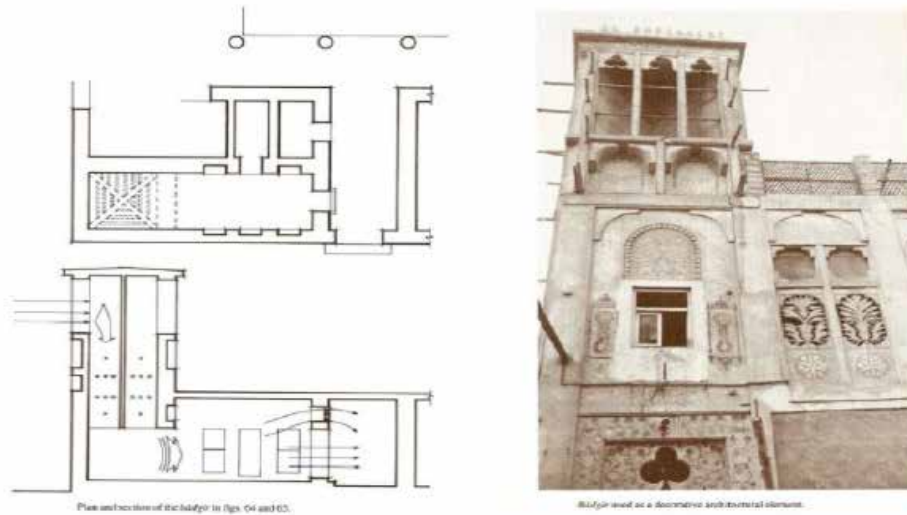


Figure 7. Almkaf . Natural energy and vernacular architecture, (Source: Fathi H. Natural Energy and Vernacular Architecture: Principles and Examples with Reference to Hot Arid Climates, UNU, 1986; 170-172.)

## 8. Building materials and techniques

Building techniques were mostly dependent on the available building materials at the time which were varying from one region to another. In order to sustain and take advantage of the traditional know-how new models of built form and of direct interaction with the traditional modes of building need to be established [1]. The below figure provides example of different materials related to traditional Qatari architecture.

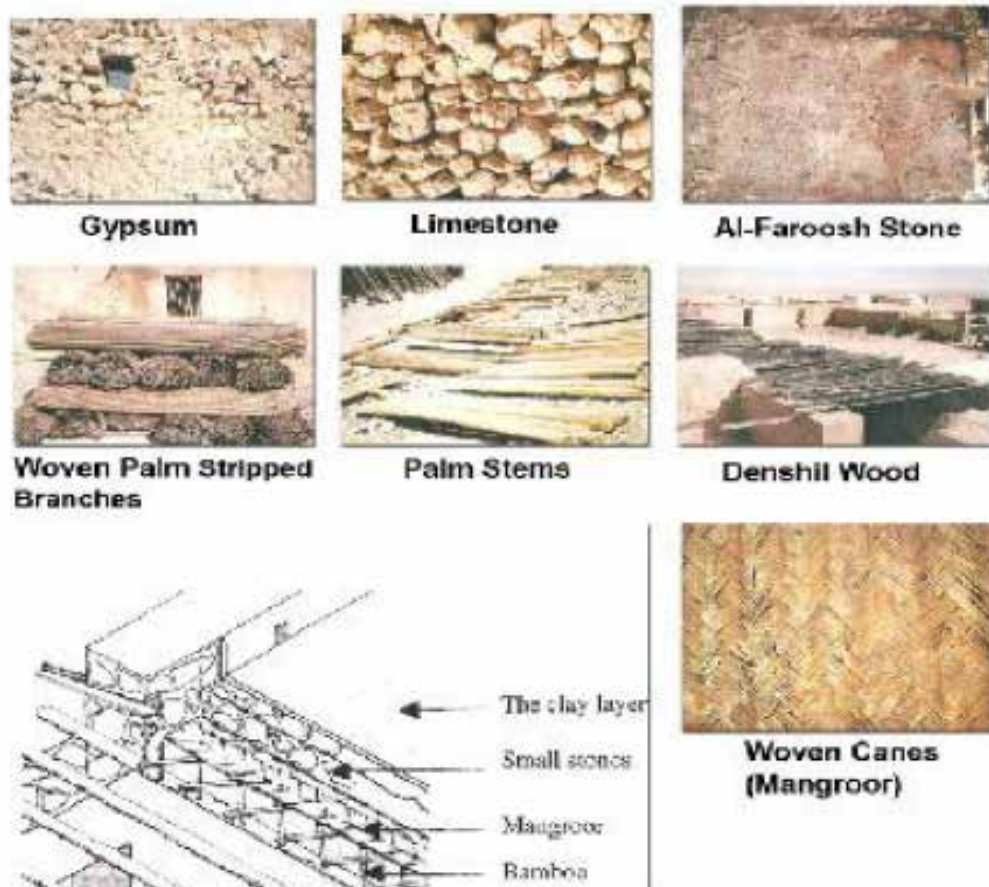


Figure 8. Example of different materials been used in traditional Qatari architecture, (Source: Qatar University. Language for Contemporary Qatari Architecture, 2010.)

## 9. Contemporary house design and form in Doha

The newer Qatari buildings present a dramatic contrast to the older traditional ones described previously, as we see in the below figure. These tend to be the high-rise type arranged in regular patterns along a grid system of streets. The Modern architecture tended to design houses in a vacuum and to produce blocks floating in an abstract urban space emptied of all its essential qualities. Individual blocks do not contribute to a meaningful definition of public open space, as related to corresponding community activities [1].



Figure 9. Example of contemporary house, (Source: <http://www.nzdl.org/gsdldmod?d.html> >, date retrieved 17.11.2013.)

## 10. Contemporary/industrial Building in Doha

The new building materials are mostly structural steel and reinforced concrete blocks and the entire surface covered with colored stucco, as we shown in the figure 9. All of which are of low quality and structurally substandard for the environment. [1] Says, Apart from the typological incompatibilities, modern Western architecture also shows a lack of consideration for local building technologies, due to its bias towards heavy industrial means of environmental control.



Figure 10. Reinforced concrete and steel structure blocks, (Source: <http://www.colourbox.com/image/doha-downtown-skyline-image-3352079>>, date retrieved 17.11.2013.)

## 11. Conclusion

This study has been put some conclusions, results and recommendations that tries to develop an optimal standards and design parameters for contemporary and future architectural design and housing design in Doha city. This will allows us to derive lessons to be useful in our professional practice now a days and in the future. Each design parameter addressed in this study was evolved according to the information given by the comparison between the traditional and contemporary architecture of Doha. This process was developed by selecting the advantages of

each value system as a design basis, and rejecting the disadvantages.

#### Design parameters

These Design parameters are presented to express a generally varied principles which can be used over and over again. Since all of them deal specifically with Doha/Qatar.

#### Urban Morphology-Urban Fabric of Doha

Any discussion of urban design in Qatari environment must take account of tradition as described earlier, with some modifications to ideally function in the present time. A study of the traditional Doha's town helps to identify the important or common features of the urban design which should be considered in the planning of new towns or neighborhoods.

The principal elements of the traditional Qatari style as previously described, included narrow lanes (not wide enough to accommodate cars), the irregular street pattern, and the courtyard house, must be emphasized in the design.

#### Urban morphology-streets

In the traditional Doha, and for centuries, the street provided city dwellers with usable public space, right outside their houses. Now, the modern city have made streets which are for "going through" not for "staying in", and which are so unattractive to stay in, that they almost force people into their houses.

#### Architectural design-house design and form

From the comparison between the traditional Qatari house and the contemporary Qatari house, it is precisely seen that the traditional house was, and in many aspects still is the perfect solution for the existing culture and people with their surrounding environment. Yet it is not functional enough for the people who are going to occupy it now, or in the near future, because of the new needs and life style of those people.

The contemporary Qatari house, on the other hand, has got its advantages in the present time in terms of speed and efficiency. But it is unlikely to serve the socio-cultural needs of people.

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## Preparing the paper for A&S Journal

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### **Abstract**

This article provides the instructions for preparing the paper for A&S Journal. Recommended, but not limited text processor is Microsoft Word. Insert an abstract of 150-200 words, giving a brief overview of the most relevant aspects of the paper.

It is essential that you provide up to ten keywords that best describe unique content of your paper. The Keyword should appear on the new line following the last line of the abstract, without a line space, set in Times New Roman 12pt as in the following example:

**Key words:** *heritage, group of monument, authenticity, medieval cities, fortresses*

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Title page - Every article has to have a title page with a title of no more than 10 words: name (s), last and first of the author (s), name of the institution the author (s) belongs to, abstract, keywords, introduction, etc.

The paper has to be typed on a standard size paper (format A4), leaving left margins to be at least 3 cm. All materials, including tables and references, have to be typed single-spaced. Main text should be set in 12 pt Times Roman or Times New Roman (normal), not in bold. All of the text should be printed as a one column and JUSTIFIED throughout.

In order to achieve high quality of Papers, the authors are requested to follow instructions given in this sample paper. Regular length of the papers up to 12 pages (text should be between 7000-9000 words).



## 2. Instructions for the authors

The margins for A4 paper are given in Table 1.

Paper size	A4
Top margin	20 mm
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Table 1. Page layout description

Regular paper may be divided in a number of sections. Sections can be split in subsections. Titles and subtitles should be typed using 12 pt fonts bold including numbering.

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Tables have to be numbered and appear by order, so they can be understood without having to read the paper. Every column needs to have title, every measuring unit (SI) has to be clearly marked, preferably in footnotes above the table, in Arabian numbers or symbols.


Table 2. Text here

Pictures also have to be numbered as they appear in text. It is appreciated if the author marks the place for table or picture inside the text.

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Each figure must have a caption under the figure.

For the figure and tables captions Times New Roman 10 pt Italic font should be used.

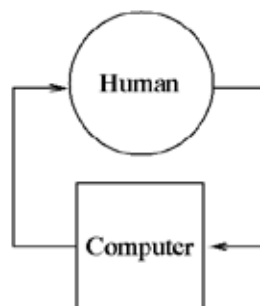


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**In the text a reference is shown in square bracket [1].**

#### 6. Conclusion

Be brief and give most important conclusion from your paper. Do not use equations and figures.

Acknowledgements (If any)

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#### References

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